Access DB# 76490

SEARCH REQUEST FORM

Scientific and Technical Information Center

Requester's Full Name: Raymond Alejandro Examiner #: 76895 Date: 09/23/02
Art Unit: 1745 Phone Number 306-3326 Serial Number: 09/707009
Mail Box and Bldg/Room Location: CPlaza 3, 8E02 Results Format Preferred (circle): PAPER DISK E-MAIL

If more than one search is submitted, please prioritize searches in order of need.

****

Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: Multi-cell Battery

Inventors (please provide full names): Higley et al

Earliest Priority Filing Date: 11/06/00

For Sequence Searches Only *Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.*

Please, refer to claims 1-69 (attached copy) for specific subject matter to be searched.

****

STAFF USE ONLY	Type of Search	Vendors and cost where applicable
Searcher: K. Fraser	NA Sequence (#)	STN ✓
Searcher Phone #:	AA Sequence (#)	Dialog
Searcher Location:	Structure (#)	Questel/Orbit
Date Searcher Picked Up:	Bibliographic ✓	Dr.Link
Date Completed: 9/26/02	Litigation	Lexis/Nexis
Searcher Prep & Review Time: 30	Fulltext	Sequence Systems
Clerical Prep Time:	Patent Family	WWW/Internet
Online Time: 45	Other	Other (specify)

PTO-1590 (8-01)

=> FILE WPIX
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L63 161 SEA FILE=WPIX ABB=ON BATTER? AND PLURAL?(3A)CELL#
L64 20 SEA FILE=WPIX ABB=ON (L62 OR L63) AND GAS?(3A)(PORT# OR
VENT?)
L65 2 SEA FILE=WPIX ABB=ON (L62 OR L63) AND GAS?(3A)(MEMBRANE? OR
HYDROPHOB?)
L66 5 SEA FILE=WPIX ABB=ON (L62 OR L63) AND GAS?(3A)OPEN?
L67 25 SEA FILE=WPIX ABB=ON (L64 OR L65 OR L66)
L72 20 SEA FILE=NTIS ABB=ON (L62 OR L63) AND GAS?
L84 37 SEA FILE=WPIX ABB=ON L72 AND (VENT? OR OUTLET? OR OPEN? OR
PORT? OR VENT?)(5A)GAS?
L85 38 SEA FILE=WPIX ABB=ON L67 OR L84
L86 33 SEA FILE=WPIX ABB=ON L85 AND H01M?/IC

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FILE LAST UPDATED: 25 Sep 2002 (20020925/ED)

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L63 161 SEA FILE=WPIX ABB=ON BATTER? AND PLURAL?(3A)CELL#
L64 20 SEA FILE=WPIX ABB=ON (L62 OR L63) AND GAS?(3A)(PORT# OR VENT?)
L65 2 SEA FILE=WPIX ABB=ON (L62 OR L63) AND GAS?(3A)(MEMBRANE? OR HYDROPHOB?)
L66 5 SEA FILE=WPIX ABB=ON (L62 OR L63) AND GAS?(3A)OPEN?
L72 20 SEA FILE=NTIS ABB=ON (L62 OR L63) AND GAS?
L80 11 SEA FILE=HCAPLUS ABB=ON (L64 OR L65 OR L66)
L82 15 SEA FILE=HCAPLUS ABB=ON L72 AND (VENT? OR OUTLET? OR OPEN? OR PORT? OR VENT?)(5A)GAS?
L83 18 SEA FILE=HCAPLUS ABB=ON L80 OR L82

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L63 161 SEA FILE=WPIX ABB=ON BATTER? AND PLURAL?(3A)CELL#
L64 20 SEA FILE=WPIX ABB=ON (L62 OR L63) AND GAS?(3A)(PORT# OR VENT?)
L65 2 SEA FILE=WPIX ABB=ON (L62 OR L63) AND GAS?(3A)(MEMBRANE? OR HYDROPHOB?)
L66 5 SEA FILE=WPIX ABB=ON (L62 OR L63) AND GAS?(3A)OPEN?
L68 0 SEA FILE=JICST-EPLUS ABB=ON (L64 OR L65 OR L66)
L72 20 SEA FILE=NTIS ABB=ON (L62 OR L63) AND GAS?
L78 0 SEA FILE=JICST-EPLUS ABB=ON L72 AND (VENT? OR OUTLET? OR OPEN? OR PORT? OR VENT?)
L79 0 SEA FILE=JICST-EPLUS ABB=ON L68 OR L78

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L63 161 SEA FILE=WPIX ABB=ON BATTER? AND PLURAL?(3A)CELL#
L64 20 SEA FILE=WPIX ABB=ON (L62 OR L63) AND GAS?(3A)(PORT# OR VENT?)
L65 2 SEA FILE=WPIX ABB=ON (L62 OR L63) AND GAS?(3A)(MEMBRANE? OR HYDROPHOB?)
L66 5 SEA FILE=WPIX ABB=ON (L62 OR L63) AND GAS?(3A)OPEN?
L70 0 SEA FILE=COMPENDEX ABB=ON (L64 OR L65 OR L66)
L72 20 SEA FILE=NTIS ABB=ON (L62 OR L63) AND GAS?
L76 2 SEA FILE=COMPENDEX ABB=ON L72 AND (VENT? OR OUTLET? OR OPEN? OR PORT? OR VENT?)
L77 2 SEA FILE=COMPENDEX ABB=ON L70 OR L76

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L63 161 SEA FILE=WPIX ABB=ON BATTER? AND PLURAL?(3A)CELL#
L64 20 SEA FILE=WPIX ABB=ON (L62 OR L63) AND GAS?(3A)(PORT# OR VENT?)
L65 2 SEA FILE=WPIX ABB=ON (L62 OR L63) AND GAS?(3A)(MEMBRANE? OR HYDROPHOB?)
L66 5 SEA FILE=WPIX ABB=ON (L62 OR L63) AND GAS?(3A)OPEN?
L71 0 SEA FILE=NTIS ABB=ON (L64 OR L65 OR L66)
L72 20 SEA FILE=NTIS ABB=ON (L62 OR L63) AND GAS?
L73 1 SEA FILE=NTIS ABB=ON L72 AND (VENT? OR OUTLET? OR OPEN? OR PORT? OR VENT?)
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FILE COVERS APR 1973 TO MAY 31, 2002

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=> D QUE L79
L62         1162 SEA FILE=WPIX ABB=ON  BATTER? AND (MULTI(W)CELL? OR MULTICELL?
                 OR CELL#(3A)(SERIES OR SERIAL?))
L63          161 SEA FILE=WPIX ABB=ON  BATTER? AND PLURAL?(3A)CELL#
L64           20 SEA FILE=WPIX ABB=ON  (L62 OR L63) AND GAS?(3A)(PORT# OR
                 VENT?)
L65            2 SEA FILE=WPIX ABB=ON  (L62 OR L63) AND GAS?(3A)(MEMBRANE? OR
                 HYDROPHOB?)
L66            5 SEA FILE=WPIX ABB=ON  (L62 OR L63) AND GAS?(3A)OPEN?
L68            0 SEA FILE=JICST-EPLUS ABB=ON  (L64 OR L65 OR L66)
L72           20 SEA FILE=NTIS ABB=ON  (L62 OR L63) AND GAS?
L78            0 SEA FILE=JICST-EPLUS ABB=ON  L72 AND (VENT? OR OUTLET? OR
                 OPEN? OR PORT? OR VENT?)
L79            0 SEA FILE=JICST-EPLUS ABB=ON  L68 OR L78


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PROCESSING COMPLETED FOR L77
PROCESSING COMPLETED FOR L74
PROCESSING COMPLETED FOR L79
L87           52 DUP REM L86 L83 L77 L74 L79 (2 DUPLICATES REMOVED)

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L62         1162 SEA FILE=WPIX ABB=ON  BATTER? AND (MULTI(W)CELL? OR MULTICELL?
                 OR CELL#(3A)(SERIES OR SERIAL?))
L63          161 SEA FILE=WPIX ABB=ON  BATTER? AND PLURAL?(3A)CELL#
L64           20 SEA FILE=WPIX ABB=ON  (L62 OR L63) AND GAS?(3A)(PORT# OR
                 VENT?)
L65            2 SEA FILE=WPIX ABB=ON  (L62 OR L63) AND GAS?(3A)(MEMBRANE? OR
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            HYDROPHOB?)
L66           5 SEA FILE=WPIX ABB=ON  (L62 OR L63) AND GAS?(3A)OPEN?
L69           7 SEA FILE=JAPIO ABB=ON  (L64 OR L65 OR L66)


=> DUP REM L86 L83 L77 L74 L69
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PROCESSING COMPLETED FOR L69
L88          59 DUP REM L86 L83 L77 L74 L69 (2 DUPLICATES REMOVED)

=> D L88 ALL 1-59

L88  ANSWER 1 OF 59  WPIX (C) 2002 THOMSON DERWENT     DUPLICATE 1
AN   2002-575337 [61]   WPIX
DNN  N2002-456114       DNC C2002-162985
TI   Multi-cell nickel halide bipolar battery for
     industrial and commercial application, has gas port in
     enclosure, to allow passage of cell gases and prevent passage of
     electrolyte from cell.
DC   A85 L03 X16
IN   CORRIGAN, D A; HIGLEY, R L; MULLER, M D
PA   (OVON-N) OVONIC BATTERY CO INC
CYC  31
PI   WO 2002049126 A2 20020620 (200261)* EN   52p    H01M000-00      <--
        RW: AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE TR
         W: AU BR CA CN IN JP KR MX NO RU SG UA
ADT  WO 2002049126 A2 WO 2001-US46059 20011023
PRAI US 2000-707009   20001106
IC   ICM H01M000-00
AB   WO 200249126 A UPAB: 20020924
     NOVELTY - An enclosure houses positive and negative electrode (4, 5) and
     electrolyte of electrochemical cells. A gas port made
     of polymeric and hydrophobic materials, is provided in the enclosure to
     allow passage of cell gases into and out of the cell, and
     prevent the passage of electrolyte out of the cell.
          USE - For industrial and commercial applications like fork lifts,
     golf carts, electric vehicles (EV), hybrid electric vehicles (HEV), motor
```

applicants

cycles, etc.
ADVANTAGE - The **gas membrane** is highly reliable against electrolyte leakage between the wafer cells, hence formation of electrolytic shorting paths between cells is avoided.
DESCRIPTION OF DRAWING(S) - The figure shows the **multi-cell** nickel halide bipolar **battery**.
Positive and negative electrode 4, 5
Dwg.1/9
FS CPI EPI
FA AB; GI
MC CPI: A12-E06B; A12-E09; L03-E03; L03-H05
EPI: X16-B01A3

L88 ANSWER 2 OF 59 WPIX (C) 2002 THOMSON DERWENT
AN 2002-229521 [29] WPIX
DNN N2002-176496
TI **Multi-cell** storage **battery** with **gas venting** system has ignition prevention device behind vent opening with widened collection chamber between them.
DC X16 X22
IN CRAMER, W; FREITAG, J; HAMPE, W
PA (HOPP) ACCUMULATORENWERKE HOPPECKE ZOELLNER KAR; (CRAM-I) CRAMER W; (FREI-I) FREITAG J; (HAMP-I) HAMPE W
CYC 27
PI EP 1156539 A2 20011121 (200229)* DE 8p H01M002-12 <--
R: AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO SE SI TR
DE 10023746 A1 20011122 (200229) H01M002-12 <--
US 2002031699 A1 20020314 (200229) H01M002-12 <--
ADT EP 1156539 A2 EP 2001-111512 20010511; DE 10023746 A1 DE 2000-10023746 20000515; US 2002031699 A1 US 2001-855882 20010515
PRAI DE 2000-10023746 20000515
IC ICM **H01M002-12**
ICS **H01M002-04; H01M002-08**
AB EP 1156539 A UPAB: 20020508
NOVELTY - The **battery** has a housing sealed by a housing cover with **gas**-tight upper and lower covers between which a number of corresponding labyrinth chambers for respective **battery** cells are defined, communicating with a vent line leading to at least one vent opening (6). An ignition prevention device (8) is positioned behind the vent opening, the latter positioned perpendicular to the ignition prevention device, with a widened collection chamber (7) between them at a level below the vent opening in the normal operating position of the **battery**.
USE - The **multi-cell** storage **battery** can be used as an automobile **battery**.
ADVANTAGE - The safe **venting** of the **battery gases** is ensured under all operating conditions.
DESCRIPTION OF DRAWING(S) - The figure shows a cross-sectional side view of a collection chamber between a **battery** vent opening and an ignition prevention device.
Vent opening 6
Collection chamber 7
Ignition prevention device 8
Dwg.4/4
FS EPI
FA AB; GI
MC EPI: X16-F01A; X16-F02; X16-F03B; X22-F01

L88 ANSWER 3 OF 59 HCAPLUS COPYRIGHT 2002 ACS

AN 2001:31793 HCAPLUS
DN 134:88832
TI Membrane-separated, bipolar **multicell** electrochemical reactor
IN Broman, Barry Michael; Zocchi, Andrea
PA Chemieco S.r.l., Italy
SO PCT Int. Appl., 28 pp.
CODEN: PIXXD2
DT Patent
LA English
IC ICM H01M008-24
ICS H01M008-02
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 72
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2001003224	A1	20010111	WO 1999-IT195	19990701
	W: AU, BR, CA, CN, ID, IL, IN, JP, KR, MX, NO, NZ, RO, RU, SG, TR, US, VN, ZA				
	RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
	AU 9946473	A1	20010122	AU 1999-46473	19990701
	BR 9913371	A	20010605	BR 1999-13371	19990701
	EP 1114486	A1	20010711	EP 1999-929700	19990701
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI				
	NO 2001001037	A	20010228	NO 2001-1037	20010228
PRAI	WO 1999-IT195	A	19990701		

AB A **multicell** assembly is constituted by alternately stacking two types of pre-assembled elements: a bipolar electrode holding subassembly and a membrane holding subassembly. The alternate stack of elements is piled over a bottom end element and the stack is terminated by placing over the last membrane holding element a top end electrode element. Each bipolar plate electrode holding element and each ion exchange membrane separator holding element includes a substantially similar rectangular frame piece, made of an elec. nonconductive and chem. resistant material, typically of molded plastic material, having on its upper (assembly) face grooves for receiving O-ring type **gasket** means, having an inner flange **portion** recessed from a first planar face and an elec. nonconducting retention counter-flange, and having through holes and recesses in coordinated locations disposed along two opposite sides of the rectangular frame forming, upon completion of the assembling, ducts for the sep. circulation of the neg. electrolyte and of the pos. electrolyte through all the neg. electrolyte flow chambers and all pos. electrolyte flow chambers, resp., in cascade. The bipolar reactor does not have inlet and outlet manifolds for the two electrolytes, the electrolytes flow through the resp. flow chambers in a zigzag path, that is essentially in hydraulic series or cascade mode. Preferably, two orders of parallel flow channels are defined in felt electrodes. Each order defines a comb-shaped flow distributing channel-work the parallel fingers of which interleave with the finger channels of the other order.

ST redox flow **battery** bipolar **multicell** electrochem reactor

IT **Battery** electrodes
Electrolytic cells
(membrane-sepd., bipolar **multicell** electrochem. reactor for redox flow **battery** system)

IT Secondary **batteries**
(redox-flow; membrane-sepd., bipolar **multicell** electrochem. reactor for redox flow **battery** system)

RE.CNT 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD
RE
(1) Kashima Kita Electric Power Co; EP 0814527 A 1997 HCAPLUS
(2) Morris, G; US 4886586 A 1989
(3) Occidental Chem Co; GB 2163595 A 1986
(4) Roth, D; US 4751153 A 1988

L88 ANSWER 4 OF 59 HCAPLUS COPYRIGHT 2002 ACS
AN 2001:723209 HCAPLUS
TI **Multi-cellular** accumulator also in the cover of integrated central degasing line [Machine Translation].
IN Richter, Gerolf; Streuer, Peter
PA Vb Autobatterie Gmbh, Germany
SO Ger. Offen.
CODEN: GWXXBX
DT Patent
LA German
IC ICM H01M002-12
ICS H01M010-52
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI DE 10015712	A1	20011004	DE 2000-10015712	20000329

AB [Machine Translation of Descriptors]. With a more-cellular electrical accumulator, in particular lead-acid **battery**, is present one in the cover integrated central processor degasing line (5), which connects the plugs (1) of the individual cells. The central processor degasing channel (5) leading by the plugs (1) it is in such a manner interrupted by returning built-in components (12) in the plug that from the degasing channel (5) occurring **gases** are always led by a first **gas** passage **opening** (6) in the plug (1) into the **gas** area of the cell (2) above the acid mirror and by a second **gas** passage **opening** (6) in the plug again into the degasing channel (5) are led back. The returning built-in components are walls (12), which form at least three chambers (11) in the upper section of the plug (1). Each chamber (11) possesses a passage **opening** (6) for the **gas** area of the cell.

L88 ANSWER 5 OF 59 WPIX (C) 2002 THOMSON DERWENT
AN 2000-237703 [20] WPIX
CR 2002-195115 [21]
DNN N2000-178259 DNC C2000-072378
TI **Multi-cell**, mono block **battery** used as power source for electric vehicles and motorcycles, has a **battery** case and electrochemical cells, each with electrodes, separators, electrolyte and enclosure.
DC A85 L03 X16
IN CORRIGAN, D A; GOW, P; HIGHLEY, L R; MULLER, M D; OSGOOD, A; OVSHINSKY, S R; PAYNE, J; PUTTAIAH, R; HIGLEY, L R
PA (OVON-N) OVONIC BATTERY CO INC
CYC 31

PI	WO 2000011730 A1	20000302 (200020)*	EN 44p	H01M002-00	<--
	RW: AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE				
	W: AU BR CA CN IN JP KR MX RU SG UA				
	AU 9954889	A 20000314 (200031)		H01M002-00	<--
	BR 9913253	A 20010522 (200132)		H01M002-00	<--
	EP 1110255	A1 20010627 (200137)	EN	H01M002-00	<--
	R: AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE				
	US 6255015	B1 20010703 (200140)		H01M006-42	<--
	KR 2001072859 A	20010731 (200209)		H01M002-02	<--

CN 1324499 A 20011128 (200219) H01M002-00 <--
ADT WO 2000011730 A1 WO 1999-US18627 19990817; AU 9954889 A AU 1999-54889 19990817; BR 9913253 A BR 1999-13253 19990817, WO 1999-US18627 19990817; EP 1110255 A1 EP 1999-941190 19990817, WO 1999-US18627 19990817; US 6255015 B1 US 1998-139384 19980823; KR 2001072859 A KR 2001-702258 20010222; CN 1324499 A CN 1999-812518 19990817
FDT AU 9954889 A Based on WO 200011730; BR 9913253 A Based on WO 200011730; EP 1110255 A1 Based on WO 200011730
PRAI US 1998-139384 19980823
IC ICM **H01M002-00; H01M002-02; H01M006-42**
AB WO 200011730 A UPAB: 20020418
NOVELTY - A **multi-cell**, mono block **battery** has a **battery** case (1) and electrochemical cells (3), each having positive (5) and negative electrodes. The cells also include separator (9) for isolating the electrodes but allowing for transport of ions between them, an electrolyte, and an enclosure (11) having an opening with a hydrophobic material to isolate the electrolyte and allow gas to exit.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for:

(I) a plastic **battery** case with electrochemical cells, where a coolant is passed from a channel in the bottom of the plastic case up through coolant channels which cool a portion of a cell's surface, and down through channels which cool the remainder of a cell's surface and out to another channel in the bottom of the plastic case; and

(II) a high capacity, high energy **battery** module with prismatic electrochemical cells enclosed within a case and two sets of the cells are interconnected in parallel and each of the sets of parallel interconnected cells are interconnected to each other in series.

USE - For use as power source for starter motors of internal combustion engines, for electric vehicles, hybrid electric vehicles, motorcycles, forklifts, golf carts or uninterruptable power supplies.

ADVANTAGE - The mono block **battery** is lightweight, simple, inexpensive, and combines the structural support of the **batteries**, modules and packs with air- or water-cooled thermal management system.

DESCRIPTION OF DRAWING(S) - The figure shows a planar side view of a single **battery** case with electrochemical cells.

battery case 1
electrochemical cells 3
anode 5
separator 9
cell enclosure 11a, 11b
current collection tabs 13a, 13b
positive and negative interconnects 15a, 15b
Dwg.1/7
FS CPI EPI
FA AB; GI
MC CPI: A12-E06C; A12-T04C; L03-E01; L03-H05
EPI: X16-F

L88 ANSWER 6 OF 59 HCAPLUS COPYRIGHT 2002 ACS
AN 2000:486470 HCAPLUS
DN 133:76776
TI Sealed lead acid **batteries** and their manufacture
IN Hazui, Shinya
PA Shin-Kobe Electric Machinery Co., Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 4 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM H01M010-06

ICS H01M002-02; H01M002-04; H01M002-12; H01M010-12
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2000200620	A2	20000718	JP 1999-559	19990105

AB The **batteries** have several cells sealed in a **battery** case, where the case cover has openings for every cell, and each opening is sealed by a valve structure contg. a **gas** releasing **opening** and a safety valve. The **batteries** are prepd. by inserting electrode stacks in the cells in a **battery** case, connecting the **cells** in **series**, sealing the **battery** case, injecting an electrolyte in the case, forming the electrodes while inserting a cooling pipe in the case via an opening, removing flowing electrolyte from the case after forming, and sealing the openings with the safety structure.
ST sealed lead acid **battery** manuf; safety valve sealed lead acid **battery**
IT Secondary **batteries**
(lead-acid; structure and manuf. of sealed **multi-cell** lead acid **batteries** contg. safety valves sealed on **battery** case cover)
IT Safety devices
(structure and manuf. of sealed **multi-cell** lead acid **batteries** contg. safety valves sealed on **battery** case cover)

L88 ANSWER 7 OF 59 WPIX (C) 2002 THOMSON DERWENT
AN 1999-203333 [17] WPIX
DNN N1999-149659 DNC C1999-059108
TI Rechargeable **battery** for underwater use in submarines.
DC A14 A25 A26 A85 E14 E16 L03 W06 X16
IN FEEZOR, M D
PA (FEEZ-I) FEEZOR M D
CYC 1
PI US 5876872 A 19990302 (199917)* 14p H01M006-14 <--
ADT US 5876872 A US 1996-745682 19961108
PRAI US 1996-745682 19961108
IC ICM **H01M006-14**
AB US 5876872 A UPAB: 19990511
NOVELTY - A **battery** for underwater use at a pressure at or greater than atmospheric pressure, comprises a pressure- compensation fluid layered on top of the cell electrolyte and having a density between that of the water in which the cell is used, and that of the electrolyte.
DETAILED DESCRIPTION - A **battery** for use underwater at a pressure at or greater than atmospheric pressure, and having an anode, a cathode and an associated electrolyte in a housing, further comprises a pressure-compensation fluid (I) selected from perfluoropolyether, trifluoropropylmethyl polysiloxane and chlorinated fluorocarbon polymers, with (I) floating on the electrolyte and having a density between the density of the water in which the cell is being used and the density of the electrolyte.
INDEPENDENT CLAIMS are also included for:
(1) a **multi-cell battery** array containing such **batteries**; and
(2) a method of making such a **battery**, comprising adding (I) in the **battery** housing above the electrolyte.
USE - In manned and unmanned submarines and bathyspheres used under sea water or ice, and in conditions subject to accidental flooding.
ADVANTAGE - The submersible **battery** is pressure-

compensated to permit safe recharging at depth. The heavier- than-water pressure compensation fluid forms a layer on top of the electrolyte, upon which water would float if a leak occurred, and loss of the compensation fluid does not cause a submarine vehicle to lose buoyancy with risks of uncontrolled descent and crushing of the hull under extreme pressure.

DESCRIPTION OF DRAWING(S) - The drawings show **batteries** according to the invention.

Anode 52
Cathode 54
Separator 56
Electrolyte 58
Pressure- compensation fluid 60
Pressure relief valve 62
Dwg.3,3A/7

FS CPI EPI
FA AB; GI
MC CPI: A04-E10; A05-H; A06-A00E2; A12-E06; L03-E; L03-E01D
EPI: W06-C01C3; W06-C01C7; X16-B; X16-F01A; X16-F03B

L88 ANSWER 8 OF 59 JAPIO COPYRIGHT 2002 JPO
AN 1999-111316 JAPIO
TI SOLID POLYMER TYPE FUEL CELL
IN NAKAOKA TORU; YASUO KOJI; HAMADA AKIRA; MIYAKE YASUO
PA SANYO ELECTRIC CO LTD
PI JP 11111316 A 19990423 Heisei
AI JP 1997-265432 (JP09265432 Heisei) 19970930
PRAI JP 1997-265432 19970930
SO PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1999
IC ICM H01M008-04
ICS H01M008-06; H01M008-10
AB PROBLEM TO BE SOLVED: To provide a solid polymer type fuel cell the **battery** performance of which is not damaged, even if it is put in an inclined state or receives vibrations.
SOLUTION: In a fuel cell 28, a common discharge passage 26, into which an exhaust gas after being consumed in a fuel chamber 18 and a drain flowing out together with the exhaust gas from the fuel chamber 18 flow, is installed at the lower part of a module 24 formed by accumulating a **plurality** of unit **cells** 22, so as to pass through the module 24 in the longitudinal direction, and a gas and drain discharging passage 26 which discharges the exhaust gas and the drain from the common discharge passage 26 to the outside of the module 24 communicates with the common discharge passage 26 through a common exhaust port 30. In this case, a **gas** and drain exhaust **port** 34 is installed at the end part of the upstream side of the gas and drain discharging passage 26, and the **gas** and drain exhaust **port** 34 is constituted so as to be positioned at the lowest place of the module 24, even when the module is put in an inclined state by having the solid polymer type fuel cell 28 installed at an inclined position and subjected to vibrations at transfer.
COPYRIGHT: (C)1999,JPO

L88 ANSWER 9 OF 59 HCAPLUS COPYRIGHT 2002 ACS
AN 1998:509003 HCAPLUS
DN 129:151158
TI **Multi-cell** hydride **batteries**
IN Takai, Masahiko; Fukunaga, Hiroshi; Nagai, Tatsu
PA Hitachi Maxell, Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 10 pp.
CODEN: JKXXAF
DT Patent

LA Japanese
IC ICM H01M010-24
ICS H01M002-12
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 10208768	A2	19980807	JP 1997-22121	19970120

AB The **batteries** have .gtoreq.2 in series and/or in parallel connected unit cells, contg. cathodes and H absorbing alloy anodes, and **gas** permeable **membranes** between the cells. The membrane is preferably porous polytetrafluoroethylene **membranes** having **gas** permeability 0.2-7 cm3/cm2.s (JIS P 8117) and water resistance 0.02-2 kg/cm2 (JIS L 1092).
ST **multi cell** hydride **battery**
polytetrafluoroethylene membrane
IT Secondary **batteries**
(characteristics of porous polytetrafluoroethylene membranes between unit cells in **multi-cell** hydrogen **batteries**
)
IT Fluoropolymers, uses
RL: DEV (Device component use); PRP (Properties); USES (Uses)
(characteristics of porous polytetrafluoroethylene membranes between unit cells in **multi-cell** hydrogen **batteries**
)
IT 9002-84-0, Polytetrafluoroethylene
RL: DEV (Device component use); PRP (Properties); USES (Uses)
(characteristics of porous polytetrafluoroethylene membranes between unit cells in **multi-cell** hydrogen **batteries**
)
IT 1333-74-0, Hydrogen, uses 12054-48-7, Nickel hydroxide [Ni(OH)2] 180997-16-4
RL: DEV (Device component use); USES (Uses)
(**multi-cell** hydrogen **batteries** contg. porous polytetrafluoroethylene membranes between nickel hydroxide/hydride unit cells)

L88 ANSWER 10 OF 59 WPIX (C) 2002 THOMSON DERWENT
AN 1997-468172 [43] WPIX
DNN N1997-390569 DNC C1997-148772
TI Layered cell structure of flat type **battery** - includes two or more unit cells of same composition arranged inside metal cup whose upper end circumference is caulked with electrode kettle through airtight sealant.
DC L03 X16
PA (FJIC) FUJI ELECTROCHEMICAL CO LTD
CYC 1
PI JP 09219203 A 19970819 (199743)* 5p H01M006-12 <--
ADT JP 09219203 A JP 1996-22386 19960208
PRAI JP 1996-22386 19960208
IC ICM **H01M006-12**
ICS **H01M002-02; H01M002-22; H01M006-42; H01M010-04**
AB JP 09219203 A UPAB: 19971030
The cell includes a unit cell (10) with sequentially layered anode (4), separate (8) and cathode (6) arranged inside an electrode kettle (12). A **gasket** (14) is fitted to the **vent** of the electrode kettle. Two or more unit **cells** are connected in **series** to form a basic **battery** (2). One end of electrode plate (16) is sealed at the vent. The lower part outer side

of the basic **battery** is surrounded by a metal cup (22). The two unit cells are equipped between the base of the cup and outer base of the **battery**. The upper end circumference part of the metal cup is caulked with the electrode kettle of the basic **battery** through an airtight sealant (26).

ADVANTAGE - Eliminates need for connection member to perform caulking. Enables sufficient splicing of unit cells. Reduces size of structure.

Dwg.1/7

FS CPI EPI
FA AB; GI
MC CPI: L03-E02
EPI: X16-A; X16-A01A; X16-B01; X16-F01; X16-F03

L88 ANSWER 11 OF 59 JAPIO COPYRIGHT 2002 JPO
AN 1997-259904 JAPIO
TI FUEL **BATTERY**
IN SAITO HAJIME
PA ISHIKAWAJIMA HARIMA HEAVY IND CO LTD
PI JP 09259904 A 19971003 Heisei
AI JP 1996-63022 (JP08063022 Heisei) 19960319
PRAI JP 1996-63022 19960319
SO PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1997
IC ICM H01M008-02
ICS H01M008-04
AB PROBLEM TO BE SOLVED: To enable the flow speed of anode gas to be optimal at a reaction part even when a separator is molded by press in order to increase productivity through reduction of the number of parts, miniaturization, and cost reduction.
SOLUTION: This **battery** is provided with two flat electrodes with an anode 22 and a cathode 23, **plural cells** 31 made of flat electrolytic plate 21 pinched between these electrodes, and a separator 28 pinched between the **plural cells** 31 and is constituted. The separator 28 is formed with its continuous recess and protrusion in the waveform shape, the separator 28 is provided with an anode **gas** flow path 29 **opened** toward the anode 22 side and a cathode **gas** flow path 30 **opened** toward the cathode 23 side, and a ceramic particle 36 is accommodated in the anode gas flow path 29.
COPYRIGHT: (C)1997,JPO

L88 ANSWER 12 OF 59 HCAPLUS COPYRIGHT 2002 ACS
AN 1997:686246 HCAPLUS
DN 127:320921
TI 2-Amp TPV cogenerator using forced-air cooled gallium antimonide cells
AU Fraas, Lewis; Avery, James; Ballantyne, Russ; Custard, Paul; Ferguson, Luke; Xiang, Huang Han; Keyes, Jason; Mulligan, Bill; Samaras, John; Williams, Doug
CS JX Crystals, Inc., Issaquah, WA, 98027, USA
SO AIP Conference Proceedings (1997), 401(Thermophotovoltaic Generation of Electricity), 369-372
CODEN: APCPCS; ISSN: 0094-243X
PB AIP Press
DT Journal
LA English
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
AB A wall-mounted thermophotovoltaic (TPV) cogenerator for use as a **battery** trickle charger and 5000 Btu/h room heater on boats, in remote cabins, and in recreational vehicles is described. Propane is used to heat a proprietary matched emitter, and the emitter is surrounded by a

photovoltaic conversion array consisting of 48 **GaSb cells** connected in **series**. Warm air generated by forced-air cooling of the array cooling fins is used for room heating, while combustion exhaust **gases** are **vented** to the outside.

ST gallium antimonide thermophotovoltaic generator air cooled

IT Thermoelectric devices
Thermoelectric devices
(thermophotovoltaic solar cells; design of thermophotovoltaic cogenerator using forced-air cooled gallium antimonide cells)

IT Solar cells
Solar cells
(thermophotovoltaic; design of thermophotovoltaic cogenerator using forced-air cooled gallium antimonide cells)

IT 12064-03-8, Gallium antimonide
RL: DEV (Device component use); USES (Uses)
(design of thermophotovoltaic cogenerator using forced-air cooled gallium antimonide cells)

L88 ANSWER 13 OF 59 WPIX (C) 2002 THOMSON DERWENT
AN 1996-070407 [08] WPIX
DNN N1996-059101
TI Manifold vent cap and cover appts. for motor vehicle **battery** - comprises combined dual ganged manifold and cover with explosion attenuation device for **gas** and electrolyte return to cells system.
DC X16 X22
IN HEIMAN, J R; SLAYTON, G D
PA (GLOB) GLOBE UNION INC
CYC 7
PI EP 692828 A2 19960117 (199608)* EN 12p H01M002-12 <--
R: DE ES FR GB IT
JP 08045487 A 19960216 (199617) 9p H01M002-04 <--
EP 692828 A3 19960306 (199624) H01M002-12 <--
US 5549986 A 19960827 (199640) 12p H01M002-08 <--
ADT EP 692828 A2 EP 1995-250077 19950330; JP 08045487 A JP 1995-149164 19950615; EP 692828 A3 EP 1995-250077 19950330; US 5549986 A US 1994-260063 19940615
PRAI US 1994-260063 19940615
REP No-SR.Pub; EP 523273; GB 2042249; GB 6746; US 3772088; US 3943008; US 4009322; US 4613550; US 4916034; WO 8604186
IC ICM **H01M002-04; H01M002-08; H01M002-12**
ICS **H01M002-06; H01M002-10; H01M002-36; H01M010-48**
AB EP 692828 A UPAB: 19960227
The appts. comprises the combined dual ganged manifold and cover (10) arrangement for **batteries** with **gas** flow channelled to an explosion attenuation device (30). The attenuation device is located between the manifolds and a cover which is designed to return to the **battery** the maximum of any electrolyte which may contact the cover due to vibration, tilting, overheating or overcharging. Splash barrels (21,22,23,24,25,26) within the cover include an acid level indicator.

Feet (93) on the manifold prevent the manifolds from inadvertently being used with the cover designs. **Batteries** with terminal posts along the **battery** centreline are particularly catered for. The cover utilises external and internal **gas** pick-up systems and perpetual hill and infinite well concepts to control the acid flow. A narrow channel reduces standing wave electrolyte surface violence.

USE/ADVANTAGE - For motor car and truck **batteries**. Minimises electrolyte entrainment in exhaust flow path and facilitates

distribution of electrolyte to number of **battery** cells.
Dwg.1/9
FS EPI
FA AB; GI
MC EPI: X16-F03B; X16-F04; X22-F01

L88 ANSWER 14 OF 59 JAPIO COPYRIGHT 2002 JPO
AN 1996-171891 JAPIO
TI LEAD-ACID **BATTERY** FOR AUTOMOBILE
IN ISHIMAKI KEI; ANZAI SEIJI
PA MATSUSHITA ELECTRIC IND CO LTD
PI JP 08171891 A 19960702 Heisei
AI JP 1994-313142 (JP06313142 Heisei) 19941216
PRAI JP 1994-313142 19941216
SO PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1996
IC ICM H01M002-12
AB PURPOSE: To retain a required electrolyte amount until the **battery** life last stage even under severe conditions, and suppress the hazardousness of bursting and an influence in the case of the bursting to the minimum by communicating the gas exhaust paths of respective cells collectively via a porous body material.
CONSTITUTION: A **battery** jar 1 is partitioned into **plural cells**, and is covered by a cover 2. The gas exhaust paths set in the cover 2 are not communicated, and are independent of respective cells, and collective exhaust is conducted via a porous body material 4 set at **gas** exhaust **port** portions 5. Thereby, respective gas exhaust paths are independent of each other, and only the material 4 is common, and the move of electrolyte from a cell to a next cell is prevented even under high vibration. Even if the electrolyte enters the exhaust path from an exhaust-cum-reflux opening 7 by the vibration, the electrolyte is not allowed to move to other cell and the electrolyte level fluctuation is not allowed to occur caused by electrolyte leak. Even if a certain cell bursts resulting from inside firing, other cell is not allowed to catch fire, and further the power of a burst can be suppressed.
COPYRIGHT: (C)1996,JPO

L88 ANSWER 15 OF 59 JAPIO COPYRIGHT 2002 JPO
AN 1996-162134 JAPIO
TI PHOSPHORIC ACID TYPE FUEL CELL
IN NAKAJIMA KAZUYOSHI
PA TOSHIBA CORP
PI JP 08162134 A 19960621 Heisei
AI JP 1994-300581 (JP06300581 Heisei) 19941205
PRAI JP 1994-300581 19941205
SO PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1996
IC ICM H01M008-02
AB PURPOSE: To provide a long-lived and highly reliable phosphoric acid type fuel cell in which phosphoric acid in the cell can be immediately moved from the vicinity of a **gas** outlet **port** to the vicinity of a **gas** inlet **port** within a unit cell plane by changing at least either one of gas passages for fuel and oxidant.
CONSTITUTION: In this phosphoric acid type fuel cell, a matrix layer for holding a phosphoric acid which is an electrolyte is interposed between gas diffusion electrodes, and a **plurality** of unit **cells** constituted so as to pass a fuel and an oxidant are laminated on the gas diffusion electrodes. A cooling plate is inserted and set every several cells, and gas manifolds 4 for supplying and discharging the fuel and the oxidant to and from the gas diffusion electrodes, respectively, are arranged on the side surfaces of the **battery** body. The space between the gas manifold 4 and the **battery** body is sealed. The

following means are further added to this constitution: at least one of gas passages for fuel and oxidant gas is set so as to return and carry it from the center part of each unit cell to both the end part.

L88 ANSWER 16 OF 59 COMPENDEX
AN 1997(14):643 COMPENDEX
TI Electrolyte management considerations in modern nickel/hydrogen and nickel/cadmium cell and **battery** designs.
AU Thaller, Lawrence H. (Aerospace Corp, El Segundo, CA, USA); Zimmerman, Albert H.
SO Journal of Power Sources v 63 n 1 Nov 1996.p 53-61
CODEN: JPSODZ ISSN: 0378-7753
PY 1996
DT Journal
TC General Review; Theoretical; Experimental
LA English
AB Three general areas where potassium ion content affects the performance and life of nickel/hydrogen and nickel cadmium cells are reviewed.Sample calculations of the concentration or volume changes within the operating cells are also presented.With the aid of an accurate model, the impact of changes on the potassium within a cell design can be estimated.These areas are: gamma phase uptake of potassium, transport of water vapor from a warmer to a cooler **portion** of the cell, and the impact of low level shunt currents in **multicell** configuration.These movements affect the electrolyte volume/vapor pressure relationships of the cell or **battery**.16 Refs.
CC 702.1.2 Secondary Batteries; 803 Chemical Agents; 804 Chemical Products Generally; 702 Electric Batteries and Fuel Cells; 804.2 Inorganic Components; 902.2 Codes and Standards
CT *Nickel cadmium **batteries**; Solvents; Service life; Fits and tolerances; Mathematical models; Composition effects; Porous materials; Diffusion in **gases**; Electrolytes; Potassium compounds
ST Nickel hydrogen cells; **Battery** designs; Potassium hydroxide

L88 ANSWER 17 OF 59 WPIX
AN 1995-215408 [28] WPIX
DNN N1995-168887
TI Flooded electrolyte storage **battery** with electrolyte circulation system - has inlet port and electrolytic transport channel within each cell and carry-over passages hydraulically connecting adjacent cells, with pump used to circulate electrolyte.
DC X16
IN BRECHT, W B
PA (TROJ-N) TROJAN BATTERY CO
CYC 43
PI WO 9515586 A1 19950608 (199528)* EN 34p H01M002-38 <--
RW: AT BE CH DE DK ES FR GB GR IE IT LU MC NL OA PT SE
W: AT AU BB BG BR CA CH CZ DE DK ES FI GB HU JP KP KR KZ LK LU MG MN MW NL NO NZ PL PT RO RU SD SE SK UA US
AU 9468118 A 19950619 (199540) H01M002-38 <--
US 5543243 A 19960806 (199637) 21p H01M002-38 <--
EP 737368 A1 19961016 (199646) EN 34p H01M002-38 <--
R: AT BE CH DE ES FR GB IE IT LI
AU 675326 B 19970130 (199713)# H01M002-38 <--
JP 09505936 W 19970610 (199733) 48p H01M002-38 <--
EP 737368 A4 19971119 (199840) H01M002-38 <--
CA 2177618 C 19990706 (199946) EN H01M002-38 <--
ADT WO 9515586 A1 WO 1993-US11698 19931201; AU 9468118 A WO 1993-US11698 19931201, AU 1994-68118 19931201; US 5543243 A WO 1993-US11698 19931201,

US 1994-290742 19940823; EP 737368 A1 WO 1993-US11698 19931201, EP 1994-916482 19931201; AU 675326 B AU 1994-68118 19931201; JP 09505936 W WO 1993-US11698 19931201, JP 1995-515578 19931201; EP 737368 A4 EP 1994-916482 19931201; CA 2177618 C CA 1993-2177618 19931201, WO 1993-US11698 19931201

FDT AU 9468118 A Based on WO 9515586; US 5543243 A Based on WO 9515586; EP 737368 A1 Based on WO 9515586; AU 675326 B Previous Publ. AU 9468118, Based on WO 9515586; JP 09505936 W Based on WO 9515586; CA 2177618 C Based on WO 9515586

PRAI WO 1993-US11698 19931201

REP GB 2378; US 1112861; US 1471048; US 4377445; DE 4131704

IC ICM **H01M002-38**
ICS **H01M002-36; H01M010-00; H01M010-42; H01M010-48**

AB WO 9515586 A UPAB: 19950721
The **battery** (10) has liquid electrolyte cells (12) with an inlet port (22) feeding the first cell (12-1). Cells have electrolyte transport channels (30) and carry-over passages (40) which hydraulically connect adjacent cells.

An outlet port (50) from the last cell (12-4) may lead to the pump (58). Electrolyte can be replenished by introducing fresh electrolyte (14) into the first cell. An electrolyte reservoir (72) may be used and temperature management can be achieved with a heat-exchanger (78). Air can be introduced for electrolyte level adjustment.

USE/ADVANTAGE - Facilitates non-hazardous replenishment of electrolyte and facilitates mixing and homogenisation without having to overcharge cells.

Dwg.1/9

FS EPI

FA AB; GI

MC EPI: X16-F04

L88 ANSWER 18 OF 59 WPIX (C) 2002 THOMSON DERWENT

AN 1995-214641 [28] WPIX

DNN N1995-168309

TI Wet, **multi-cell** lead-acid electric storage **battery** for use in land-moving vehicle, e.g. bulldozer (RTM) - comprises container with cover and partition walls, and venting system including manifold defined by cover, with manifold being adapted to provide **gaseous** communication between process holes and ambient.

DC X16 X22 X25

IN ADAMS, D W; BAUMGARTNER, D S; HAKARINE, D D

PA (GNBB) GNB BATTERY TECHNOLOGIES INC

CYC 2

PI	US 5422199	A	19950606 (199528)*	8p	H01M002-12 <--
	AU 9479096	A	19950615 (199532)		H01M002-12 <--
	AU 681451	B	19970828 (199743)		H01M002-12 <--

ADT US 5422199 A US 1993-162707 19931206; AU 9479096 A AU 1994-79096 19941129; AU 681451 B AU 1994-79096 19941129

FDT AU 681451 B Previous Publ. AU 9479096

PRAI US 1993-162707 19931206

IC ICM **H01M002-12**

AB US 5422199 A UPAB: 19950721
The electric storage **battery** comprises a container, a cover, and one or more partition walls dividing the space within the container and cover into two or more cell cavities. The cover defines cylindrically shaped process holes associated with each cell cavity. The **battery** includes the venting system which comprises a manifold defined by the cover. The manifold has at least one opening in each process hole and at least one opening in the cover and is adapted to provide **gaseous**

communication between the process holes and the ambient.

A venting plug is associated with each process hole and adapted for insertion in them. The venting plugs have a cylindrical side wall, a closed upper end, an open lower end, and a central cavity. A vent aperture is located in the side wall of the **venting** plug in **gaseous** communication with the manifold and the venting plug central cavity. A baffle is positioned within the venting plug central cavity between the vent aperture and the lower end of the venting plug, and is adapted to allow the passage of **gases** and to retard the passage of electrolyte from the cell cavity through the venting plug central cavity.

ADVANTAGE - Easy and economic mfr. Safely and efficiently **vents gases** generated within cell cavities.

Dwg.2/3

FS EPI
FA AB; GI
MC EPI: X16-B01B; X16-F03B; X22-F01; X22-P07; X25-D01

L88 ANSWER 19 OF 59 WPIX (C) 2002 THOMSON DERWENT
AN 1995-277229 [37] WPIX
DNN N1995-212060 DNC C1995-125576
TI Dangerous **gas** detector for emitted from **battery** of electronic appts e.g. computer, household goods, toys, flashlight - uses safety electrical circuit that responds to heat-sensitive element designed to detect exothermic reaction produced by detected **gas** and catalyst.
DC J04 L03 T01 W04 X16 X26
IN BAILEY, J C; FOLEY, T D
PA (EVEY) EVEREADY BATTERY CO INC
CYC 4

PI	GB 2286680	A	19950823 (199537)*	12p	H01M010-52	<--
	JP 07312824	A	19951128 (199605)	6p	H02H005-04	
	US 5483228	A	19960109 (199608)	5p	G08B017-10	
	GB 2286680	B	19980225 (199811)		H01M010-52	<--
	SG 47474	A1	19980417 (199826)		G01N027-16	

ADT GB 2286680 A GB 1995-1806 19950131; JP 07312824 A JP 1995-12442 19950130; US 5483228 A US 1994-188868 19940131; GB 2286680 B GB 1995-1806 19950131; SG 47474 A1 SG 1996-2078 19950131
PRAI US 1994-188868 19940131
IC ICM G01N027-16; G08B017-10; **H01M010-52**; H02H005-04
ICS G08B021-00; **H01M008-04**; H02H005-00
AB GB 2286680 A UPAB: 19950927
The detector uses a material to catalyse an exothermic reaction involving a **gas** to be detected and a heat-sensitive element. The latter is arranged so as to be sensitive to the exothermic reaction. The element forms part of a safety circuit such that the condition of the circuit is altered on exposure of the element to the exothermic reaction. The safety circuit is an electrical circuit and the element is electrically conductive.

The electrical circuit comprises a power supply connected to an indicator. The heat-sensitive conductive element is connected as a switch between the power supply and the indicator so that when a build-up of a predetermined level of **gas** to be monitored is reached, the exothermic reaction of the reactant with the **gas** on the surface of the catalytic **gas** combination material will produce heat. The latter is detected by the heat-sensitive conductive element and is sufficient to change the conductivity of the heat-sensitive conductive element in the circuit and thereby change the condition of the indicator. The heat-sensitive element is a bimetallic switch, positive temperature coefficient resistor or a thermistor. The catalyst is selected from

palladium alloys, platinum alloys, rhodium, rhodium alloys, platinum-catalysed MnO2, nickel boride, Raney nickel and palladium-catalysed carbon.

ADVANTAGE- Alerts user to danger. Can provide alarm above predetermined level of **gas**.

Dwg.0/0

FS CPI EPI
FA AB
MC CPI: J04-C04
EPI: T01-L09; W04-X03E; X16-X; X26-E01

L88 ANSWER 20 OF 59 WPIX (C) 2002 THOMSON DERWENT
AN 1995-083609 [12] WPIX
DNN N1995-066303
TI **Multi-cell** electric **battery** for vehicle starter motor - has porous mesh supported in recess in **battery** cover above side channel communicating with **gas** collection channel.
DC X16 X22
IN BOEHLE, C; EISENACHER, W; GUMMELT, K
PA (VART) VB AUTOBATTERIE GMBH
CYC 4
PI EP 639862 A1 19950222 (199512)* DE 6p H01M002-12 <--
EP 639862 B1 19960918 (199642) DE 6p H01M002-12 <--
R: DE ES FR IT
DE 59400680 G 19961024 (199648) H01M002-12 <--
ES 2092360 T3 19961116 (199702) H01M002-12 <--
ADT EP 639862 A1 EP 1994-108058 19940526; EP 639862 B1 EP 1994-108058 19940526; DE 59400680 G DE 1994-500680 19940526, EP 1994-108058 19940526; ES 2092360 T3 EP 1994-108058 19940526
FDT DE 59400680 G Based on EP 639862; ES 2092360 T3 Based on EP 639862
PRAI DE 1993-12250U 19930817
REP DE 9312250; EP 178422; EP 305822; EP 355461; EP 514918; EP 523273
IC ICM **H01M002-12**
ICS **H01M010-48**
AB EP 639862 A UPAB: 19950328
The **battery** has a central **gas vent** incorporated in the **battery** cover, with an associated porous mesh (5) for explosion protection. A **gas** collection channel extends parallel to the line connecting the **battery** stops, with a recess (8) in the sidewall of the cover at one side, coupled to the collection channel via a side channel (3). An insert (9) fitted into the recess incorporates the porous mesh, supported at an angle.

Pref. a collection space (10) is provided beneath the porous mesh, for receiving the electrolyte separated by the latter. The porous mesh may be inclined at an angle of between 5 and 85 degrees reactive to the surface of the **battery** electrolyte.

ADVANTAGE - Prevents dangerous increase in **battery** internal pressure.

Dwg.3/4

FS EPI
FA AB; GI
MC EPI: X16-F; X22-F01

L88 ANSWER 21 OF 59 WPIX (C) 2002 THOMSON DERWENT
AN 1993-370153 [47] WPIX
DNN N1993-285786 DNC C1993-164195
TI Lead accumulator for use as starter **battery** in vehicles - comprising housing with cells and lid, and **gas** collecting chamber formed between lid and covering plate.

DC L03 X16 X22
IN BOEHLE, C; ECKERS, W; GUMMELT, K; THAETE, J
PA (VBAU-N) VB AUTOBATTERIE GMBH; (VOLS) VOLKSWAGEN AG; (VART) VB AUTOBATTERIE GMBH
CYC 14
PI EP 570703 A1 19931124 (199347)* DE 12p H01M002-12 <--
R: AT BE CH DE DK ES FR GB IT LI LU NL PT SE
DE 4216563 A1 19931125 (199348) 4p H01M002-12 <--
EP 570703 B1 19951108 (199549) DE 10p H01M002-12 <--
R: AT BE CH DE DK ES FR GB IT LI LU NL PT SE
DE 59300881 G 19951214 (199604) H01M002-12 <--
ES 2080553 T3 19960201 (199612) H01M002-12 <--
ADT EP 570703 A1 EP 1993-106363 19930420; DE 4216563 A1 DE 1992-4216563 19920520; EP 570703 B1 EP 1993-106363 19930420; DE 59300881 G DE 1993-500881 19930420, EP 1993-106363 19930420; ES 2080553 T3 EP 1993-106363 19930420
FDT DE 59300881 G Based on EP 570703; ES 2080553 T3 Based on EP 570703
PRAI DE 1992-4216563 19920520
REP DE 8007719; DE 9209986; EP 305822; EP 459162; EP 503264; EP 523273; FR 1294588; GB 1262239; US 4851305; US 4916034
IC ICM **H01M002-12**
ICS **H01M002-04; H01M010-12**
AB EP 570703 A UPAB: 19951122
Accumulator, esp. Pb-accumulator, has a housing contg. several cells and a lid. A **gas** collecting chamber is formed between the lid and covering plate to deposit acid. The chamber has a lower part in several hollow chambers corresponding to the no. of cells and a de-**gassing opening**. For each cell, there are filling and monitoring openings.
The closure stopper (1) extends into the base lid (5). A **gas outlet** site (9) is present in base lid in the region of the closure stopper, whose size is measured so that, on heating to 180 deg. C, no more acid leaves the **gas** chamber.
USE/ADVANTAGE - Used as starter **batteries** in vehicles.
Dwg.2/7
Dwg.2/7
FS CPI EPI
FA AB; GI
MC CPI: L03-E02
EPI: X16-B01B; X16-F01; X16-F03B; X22-F01

L88 ANSWER 22 OF 59 JAPIO COPYRIGHT 2002 JPO
AN 1993-094830 JAPIO
TI VERTICAL STRIPE CYLINDRICAL SOLID ELECTROLYTE FUEL CELL
IN ITO HIBIKI; MORI MASASHI; ABE TOSHIO
PA CENTRAL RES INST OF ELECTRIC POWER IND
PI JP 05094830 A 19930416 Heisei
AI JP 1991-276483 (JP03276483 Heisei) 19910930
PRAI JP 1991-276483 19910930
SO PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1993
IC ICM H01M008-02
ICS H01M008-12; H01M008-24
AB PURPOSE: To improve the output density per unit area and per unit volume of a vertical stripe cylindrical solid electrolyte fuel cell, to prevent a **battery** breakdown to generate a thermal stress, and to make the quality control and the manufacturing of the **battery** easier.
CONSTITUTION: One single cell assembly 1 is to be composed by connecting a single cell 2 whose one end is closed and at least more than one of cylindrical single cells 3a, 3b,..., 3n whose both ends are opened, which have the size manufactured by utilizing the conventional manufacturing technology already established as it is. And the single cells 2, 3a,

3b,..., 3n to compose this single cell assembly 1 are preferably to have different cell areas each other and the cell areas are formed larger as separated farther from a fuel **gas** feeding **port** 27.
Furthermore, at an oxidizer gas feeding pipe 6 and a fuel gas feeding pipe 5 provided at the inside and the outside of the single **cell** assembly 1, **plural** gas feeding holes 5a and 6a are provided to the feeding pipes 5 and 6 according to the lengths of the corresponding single cells 2, 3a, 3b,..., 3n, so as to feed the oxidizer gas and the fuel gas by distributing in the longitudinal direction of the single cell assembly 1.

L88 ANSWER 23 OF 59 WPIX (C) 2002 THOMSON DERWENT DUPLICATE 2
AN 1992-424136 [51] WPIX
DNN N1992-323660
TI Metal oxide-hydrogen **battery** with rectangular modules in cylindrical pressure vessel - has cell modules stacked side-by-side in vessel, cell sealed in rigid plastic casing with **gas vent**, terminals located centrally and heat transfer element between modules.
DC W06 X16
IN JONES, K R; KAPRELIAN, P J
PA (GLOB) GLOBE UNION INC
CYC 5
PI US 5168017 A 19921201 (199251)* 5p H01M012-08 <--
GB 2261544 A 19930519 (199320) 16p H01M012-08 <--
FR 2683096 A1 19930430 (199330) H01M012-08 <--
JP 05217606 A 19930827 (199339) H01M012-08 <--
GB 2261544 B 19950510 (199522) 2p H01M012-08 <--
ADT US 5168017 A US 1991-783004 19911028; GB 2261544 A GB 1992-22427 19921026; FR 2683096 A1 FR 1992-12851 19921028; JP 05217606 A JP 1992-286220 19921023; GB 2261544 B GB 1992-22427 19921026
PRAI US 1991-783004 19911028
IC ICM **H01M012-08**
AB US 5168017 A UPAB: 19931006
In a metal oxide-hydrogen **battery** with cylindrical outer pressure vessel, a number of cell modules are disposed within the vessel in side-by-side relation. Each cell module includes a positive and a negative terminals and contains a liquid electrolyte the terminals being locted generally centrally of the module.
Each cell module is generally rectangular in planar configuration and is enclosed by a sealed rigid electrically insulating casing, each casing having a peripheral edge disposed in bearing engagement with the vessel. A fixing device prevents relative movement of each cell module w.r.t. the corresp. casing and an electrical connector comprises the cell modules terminals in an electrical circuit.
USE/ADVANTAGE - E.g. nickel oxide-hydrogen **battery** for aircraft starter, aerospace applications. Rechargeable with very long life cycle and uniform output throughout entire discharge cycle. Has electrical connections located centrally on cell to shorten electron flow path and improve efficiency.
1/3
FS EPI
FA AB; GI
MC EPI: W06-B01C3; W06-B03B; X16-B01A3; X16-F01

L88 ANSWER 24 OF 59 WPIX (C) 2002 THOMSON DERWENT
AN 1993-018352 [02] WPIX
DNN N1993-013990 DNC C1993-008412
TI Alkaline storage **battery** for space applications and electric

vehicles - contains bipolar collectors coated with nickel felt or foam.

DC L03 W06 X16 X21

IN BRONOEL, G; BUGNET, B; TASSIN, N; BESSE, S

PA (SORA-N) SORAPEC SA; (SORA-N) LAB SORAPEC; (SORA-N) SORAPEC SARL

CYC 17

PI	WO 9222936	A2	19921223 (199302)*	FR	30p	H01M010-28	<--
	FR 2677812	A1	19921218 (199307)		23p	H01M010-30	<--
	EP 562986	A1	19930929 (199339)	FR	7p	H01M004-02	<--
	FR 2689319	A1	19931001 (199348)		15p	H01M004-70	<--
	EP 587710	A1	19940323 (199412)	FR		H01M010-28	<--
	JP 06052885	A	19940225 (199413)		5p	H01M010-18	<--
	US 5344723	A	19940906 (199435)		7p	H01M002-12	<--
	JP 07500207	W	19950105 (199511)			H01M004-24	<--
	WO 9222936	A3	19930624 (199513)			H01M010-28	<--
	EP 587710	B1	19961227 (199705)	FR	15p	H01M010-28	<--
	R: AT BE CH DE DK ES FR GB GR IT LI LU MC NL SE						
	DE 69216230	E	19970206 (199711)			H01M010-28	<--

ADT WO 9222936 A2 WO 1992-FR528 19920612; FR 2677812 A1 FR 1991-7491 19910613; EP 562986 A1 EP 1993-420137 19930326; FR 2689319 A1 FR 1992-3927 19920326; EP 587710 A1 EP 1992-912267 19920612, WO 1992-FR528 19920612; JP 06052885 A JP 1993-66440 19930325; US 5344723 A US 1993-36525 19930324; JP 07500207 W JP 1992-511294 19920612, WO 1992-FR528 19920612; WO 9222936 A3 WO 1992-FR528 19920612; EP 587710 B1 EP 1992-912267 19920612, WO 1992-FR528 19920612; DE 69216230 E DE 1992-616230 19920612, EP 1992-912267 19920612, WO 1992-FR528 19920612

FDT EP 587710 A1 Based on WO 9222936; JP 07500207 W Based on WO 9222936; EP 587710 B1 Based on WO 9222936; DE 69216230 E Based on EP 587710, Based on WO 9222936

PRAI FR 1992-3927 19920326; FR 1991-7491 19910613

REP 01Jnl.Ref; DE 2706310; DE 3907741; FR 2304188; JP 62064052; US 3795543; US 4125680; US 4267243; WO 8000285; 4.Jnl.Ref; DE 2907262; DE 3739735; DE 3916050; EP 32291; EP 384945; JP 65216766; No-SR.Pub; US 4687553; 3.Jnl.Ref

IC ICM **H01M002-12; H01M004-02; H01M004-24; H01M004-70; H01M010-18; H01M010-28; H01M010-30**

ICS **H01M002-00; H01M004-66; H01M004-80; H01M010-04**

AB WO 9222936 A UPAB: 19960618

In an alkaline (esp. Ni-Cd or Ni-hydride) storage **battery**, the **cells** are connected in **series** by a bipolar collector coated on each face with a three-dimensional nickel felt or foam structure which provides charge collection and retention of the active material filling.

Also claimed are (i) a storage **battery** comprising bipolar electrodes as in (A) and one or more safety valves located on the end plates which close the **battery**; and (ii) processes for mfg. the alkaline storage **battery**.

USE/ADVANTAGE - The **battery** has reduced wt. (e.g. 10-15% wt. redn.) and increased energy output to wt. ratio so that it is useful for space applications and for electric vehicles.

2/10

Dwg.2/10

FS CPI EPI

FA AB; GI

MC CPI: L03-E01B4

EPI: W06-B03B; X16-B01A; X21-B01

L88 ANSWER 25 OF 59 WPIX (C) 2002 THOMSON DERWENT

AN 1992-234825 [28] WPIX

DNN N1992-178740
TI Caseless **multicell** lead acid **battery** - has **battery** elements dipped into encapsulating acid-resistant material to form case.
DC X16 X22
IN BAUMANN, C J
PA (GLOB) GLOBE UNION INC
CYC 19
PI WO 9210858 A1 19920625 (199228)* EN 21p H01M002-02 <--
RW: AT BE CH DE DK ES FR GB GR IT LU NL SE
W: AU BR CA JP KR
AU 9190748 A 19920708 (199241) H01M002-02 <--
EP 560860 A1 19930922 (199338) EN H01M002-02 <--
R: DE ES FR GB IT
US 5270133 A 19931214 (199350) 6p G03G017-00
ADT WO 9210858 A1 WO 1991-US7971 19911028; AU 9190748 A AU 1991-90748 19911028, WO 1991-US7971 19911028; EP 560860 A1 WO 1991-US7971 19911028, EP 1992-900650 19911028; US 5270133 A Cont of US 1990-624197 19901206, US 1993-26269 19930304
FDT AU 9190748 A Based on WO 9210858; EP 560860 A1 Based on WO 9210858
PRAI US 1990-624197 19901206
REP EP 397248; GB 1506579; US 4530153; US 4664994; US 4885007
IC ICM G03G017-00; **H01M002-02**
ICS **H01M010-12**
AB WO 9210858 A UPAB: 19931006
The **battery** comprises **battery** elements (10) with positive and negative pasted plate with separators sandwiched between. Each is placed in a plastics bag (20) with a **vent** for **gases** of formation and/or other **gas** pressures which may develop.
The elements are dipped into an encapsulating material such as rubber, removed and dried. Alternately, the elements may be soldered together and boxed in a lightweight casing, or after dipping, dipped again to form a second layer of encapsulation.
ADVANTAGE - Reduced weight of **battery** elements, removes need for thermoplastic containers.
2/5
FS EPI
FA AB; GI
MC EPI: X16-B01B; X16-F01; X22-F01

L88 ANSWER 26 OF 59 WPIX (C) 2002 THOMSON DERWENT
AN 1993-017560 [02] WPIX
DNN N1993-013430
TI Appts. for electrically connecting cell modules of metal oxide-hydrogen **battery** - has each cell module, sealed in flexible plastic bag provided with vent which is permeable to flow of **gas** but impermeable to flow of liquid electrolyte.
DC W06 X16
IN SINDORF, J F
PA (GLOB) GLOBE UNION INC
CYC 3
PI US 5173377 A 19921222 (199302)* 5p H01M012-08 <--
GB 2261542 A 19930519 (199320) 13p H01M012-08 <--
FR 2683095 A1 19930430 (199330) H01M012-08 <--
GB 2261542 B 19950920 (199541) 1p H01M012-08 <--
ADT US 5173377 A US 1991-783006 19911028; GB 2261542 A GB 1992-22424 19921026; FR 2683095 A1 FR 1992-12850 19921028; GB 2261542 B GB 1992-22424 19921026
PRAI US 1991-783006 19911028
IC ICM **H01M012-08**

AB US 5173377 A UPAB: 19930924
The **battery** includes an outer pressure vessel containing cell modules which are each sealed in a plastic bag. Each cell module is provided with a vent which is permebale to the flow of **gas** but impermeable to the flow of liquid electrolyte. A pair of annular electrical conductors are associated with each cell module and extend through aligned holes in the bag. The conductors of each cell module are electrically insulated from each other and are disposed around an insulating tie rod.

One of the conductors is connected to the positive terminals of the cell module, while the other of the conductors is connected to the negative terminals. A series of spring washers are mounted on the tie rod and urge the portions of each bag bordering the holes into tight sealing relation with the flange of the respective conductors to prevent leakage of the electrolyte through the holes in the bag.

USE/ADVANTAGE - Aircraft starter **battery**, connects positive and negative terminals of cell modules without destroying hermetically sealed characteristics of plastic bags.

3/3

FS EPI
FA AB; GI
MC EPI: W06-B01C3; W06-B03B; X16-B01A3; X16-F01; X16-F03A

L88 ANSWER 27 OF 59 WPIX (C) 2002 THOMSON DERWENT
AN 1993-017559 [02] WPIX
DNN N1993-013429
TI Metal-oxide hydrogen **battery** having sealed cell modules with electrolyte containment and hydrogen venting - has each cell module enclosed in flexible sealed multilayer container e.g. plastic bag with **vent**, permeable to flow of hydrogen **gas** but impermeable to flow of liquid electrolyte.
DC W06 X16
IN DALEY, J T; JONES, K R; KAPRELIAN, P J; PAGE, B M; ZAGRODNIK, J P
PA (GLOB) GLOBE UNION INC
CYC 5

PI	US 5173376	A	19921222 (199302)*	5p	H01M012-08	<--
	GB 2261543	A	19930519 (199320)	14p	H01M012-08	<--
	FR 2683097	A1	19930430 (199330)		H01M012-08	<--
	JP 05217607	A	19930827 (199339)		H01M012-08	<--
	GB 2261543	B	19950524 (199524)	2p	H01M012-08	<--

ADT US 5173376 A US 1991-783005 19911028; GB 2261543 A GB 1992-22425 19921026; FR 2683097 A1 FR 1992-12854 19921028; JP 05217607 A JP 1992-288600 19921027; GB 2261543 B GB 1992-22425 19921026
PRAI US 1991-783005 19911028
IC ICM **H01M012-08**
ICS **H01M002-12**
AB US 5173376 A UPAB: 19930924
The metal oxygen-hydrogen **battery** includes an outer pressure vessel containing cell modules, each having a positive and negative terminal and containing a liquid electrolyte such as potassium hydroxide. Each cell module is enclosed in a flexible sealed bag which is impervious to the flow of the electrolyte.

The bag is a multi-layer structure preferably composed of thermoplastic film. Each bag is provided with a vent which is permeable to the flow of hydrogen **gas** but impermeable to the flow of the electrolyte. Electrical leads are connected to the terminals of each cell module and extend in sealed relation through the bag.

USE/ADVANTAGE - Aircraft starter and aerospace applications, prevents electrolyte leakage between cell modules and formation of electrical bridge, prevents drying out of cell modules of **battery**.

4/4
FS EPI
FA AB; GI
MC EPI: W06-B01C3; W06-B03B; X16-B01A3; X16-F01

L88 ANSWER 28 OF 59 WPIX (C) 2002 THOMSON DERWENT
AN 1991-355485 [49] WPIX
DNN N1991-272077
TI Lead accumulator with degassing system - has cells in groups provided with common degassing openings near combination point.
DC X16
IN BERNARDI, W; BODE, C; CRAMER, W
PA (HOPP) ACCUMULATOREN HOPPECKE ZOELLNER
CYC 2
PI EP 459162 A 19911204 (199149)*
R: DE FR
EP 459162 B1 19941102 (199442) DE 7p H01M002-12 <--
R: DE FR
DE 59103396 G 19941208 (199503) H01M002-12 <--
ADT EP 459162 A EP 1991-106971 19910430; EP 459162 B1 EP 1991-106971 19910430; DE 59103396 G DE 1991-503396 19910430, EP 1991-106971 19910430
FDT DE 59103396 G Based on EP 459162
PRAI DE 1990-5603U 19900517
REP 1.Jnl.Ref; DE 3112512; DE 9005603; EP 107469; EP 132949; EP 90570; JP 63021742; US 4613550; 01Jnl.Ref
IC **H01M002-12**
ICM **H01M002-12**
ICS **H01M002-04**
AB EP 459162 A UPAB: 19930928
The cells, as part of the total cell number, have a common degassing opening (14) in the region of the joining together of the cells. The combinations are mutually independent.
The cells may be arranged in two or more rows, the cells adjoining one another of the rows being collected together. In the case of two rows the degassing openings are between the cells on the longitudinal central line. Individual covers may be provided for the joined cells. Some covers (3') may be flat while others (3'') project as caps leaving the necessary spacing.
ADVANTAGE - Improved security against ignition.
3/5
FS EPI
FA AB; GI
MC EPI: X16-B01B; X16-F03B

L88 ANSWER 29 OF 59 NTIS COPYRIGHT 2002 NTIS
AN 1991(15):04352 NTIS Order Number: DE91736748/XAB
TI Suiso kyuzo gokin wo mochiita nickel/suiso denchi no load-conditioner eno tekiyo kanosei ni kansuru chosa. (Nickel/metal hydride rechargeable **battery** technology assesment: prognosis for load-conditioner use).
AU Ikeya, T.
CS Central Research Inst. of Electric Power Industry, Tokyo (Japan). Energy and Environment Lab. (005875002 9699261)
NR DE91736748/XAB; CRIE-T-89031
61p; Mar 1990
DT Report
CY Japan
LA Japanese
NTE In Japanese.
AV U.S. Sales Only. Order this product from NTIS by: phone at

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NTIS Prices: PC A04/MF A01

OS GRA&I9109; ERA9119

AB Nickel/metal hydride **battery** was studied, for the load-conditioner use, to use hydrogen-absorbing/storing alloy, which **battery** consists of nickel positive electrode and metal hydride negative electrode with stored quantity of hydrogen, more than 20 times as large as that of **gaseous** storage. Without consumption of electrolyte, due to charging or discharging, it is possible in maintenance freeing and enclosing. Also without change in shape, due to deposition of metallic dendrite on the negative electrode, it is long in life. With operation at ordinary temperature, the discharging curve has a wide flat **portion**, 1.2 to 1.3V in width, to be assured of 80% in energy efficiency. Hydrogen in metal hydride is so quickly diffused as to enable the charging and discharging to be quick, and resist the over charging and discharging. In Japan and the USA, that **battery** of small capacity type has been developed, but that of large capacity one has not been done yet. Presently for the load-conditioner use, the weight energy density is slightly low, but the volume energy density, cycle life, etc. are sufficiently satisfactory, with easiness in **battery** structuring, manufacturing and **multi-cell** composing, possibility of enlargement in capacity and mass production, and highness in safety. The enlargement in capacity must take into consideration thermochemical and powder technological characteristics of metal hydride. 25 refs., 20 figs., 16 tabs.

CC 97M Batteries and components

CT ***Nickel-Hydrogen Batteries***; *Power Conditioning Circuits; Alloys; Containment; Dendrites; **Gaseous Diffusion**; Hydrogen; Hydrogen Storage; Maintenance; Service Life
*FOREIGN TECHNOLOGY; EDB/250900; EDB/080201

L88 ANSWER 30 OF 59 WPIX (C) 2002 THOMSON DERWENT

AN 1990-066806 [09] WPIX

DNN N1990-051346

TI Pressure release system for electric storage **batteries** - has manifold apertures in walls each provided with independent trapping chamber with release valve.

DC X16 X22

IN JERGL, J J; KUMP, W H

PA (GNBG-N) GNB INC

CYC 1

PI US 4891270 A 19900102 (199009)* 15p

ADT US 4891270 A US 1986-856254 19860428

PRAI US 1985-770945 19850830; US 1986-856254 19860428; US 1986-865254 19860428

IC **H01M002-12**

AB US 4891270 A UPAB: 19930928
The **battery** comprises one or more manifolding apertures in one or more partition walls, which apertures are of a size which allows passage of **gases** and in wet **batteries** minimises passage of electrolyte and which define one or more sets of manifolded cells. A single trapping chamber is associated with each set of manifolded cells. One or more vent apertures is provided for wet **battery** applications or a pressure release valve for absorbed electrolyte **battery** applications is disposed between each set of manifolded cells and its trapping chamber.
The vent apertures are of a size which allows passage of

gases and in wet **batteries** minimises passage of electrolyte. Additionally, for wet **batteries** there is provided one or more drain/vent apertures between each set of manifolded cells and its respective trapping chamber. The drain apertures are of a size which allow drainage of electrolyte from the trapping chamber to the manifolded cells and minimise passage of electrolyte from the cells to the trapping chamber and a single exhaust port associated with each of the trapping chambers, which exhaust **ports** allow passage of **gas** from the trapping chambers to the ambient.
USE - **Multi-cell**, lead-acid electric storage **battery** of the wet or absorbed electrolyte type.
3/11
FS EPI
FA AB; GI
MC EPI: X16-B01B; X16-F03B; X22-F01

L88 ANSWER 31 OF 59 JAPIO COPYRIGHT 2002 JPO
AN 1990-174073 JAPIO
TI SEALED LEAD-ACID **BATTERY**
IN MUROCHI SHIYOUZOU; JINBO HIROYUKI; HIRANO FUJIO
PA MATSUSHITA ELECTRIC IND CO LTD
PI JP 02174073 A 19900705 Heisei
AI JP 1988-332957 (JP63332957 Showa) 19881227
PRAI JP 1988-332957 19881227
SO PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1990
IC ICM H01M010-12
ICS H01M010-14
AB PURPOSE: To effectively diffuse and discharge the generated hydrogen gas to the outside of an outer case and improve the explosion-proof property by laminating two or more cells into an assembled **battery** while opening directions of safety valves of unit cells are made the same and providing a vent assembly in the opening direction of the safety valve of this assembled **battery**.
CONSTITUTION: A positive electrode plate and a negative electrode plate are arranged oppositely to a separator to form an electrode plate group, and this electrode plate group is sealed in a synthetic resin film **battery** jar with a safety valve 2 together with an electrolyte to form a unit cell 1. Unit cells 1 are stacked while opening directions of safety valves are made the same, they are put in an aluminum case 3, the fixed group pressure is applied to cells, and an assembled **battery** connected with terminals of unit **cells** in **series** is stored in an outer case 3 with vent holes. Two or more vent holes are provided at the position near the opening section of the safety valve of the assembled **battery** as a collection body 7 of **vent** holes. Hydrogen **gas** is diffused and discharged through the collection body 7 of vent holes, the concentration of hydrogen in the outer case 3 is reduced, and the explosion-proof property of a storage **battery** can be increased.
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L88 ANSWER 32 OF 59 WPIX (C) 2002 THOMSON DERWENT
AN 1989-070033 [10] WPIX
DNN N1989-053492
TI **Multi-cell battery** with integral vent line - has capsule fitted into **battery** cover incorporating over pressure valve and porous block.
DC X16
IN PETRI, B; STREUER, P
PA (VART) VARTA BATTERIE AG; (VART) VB AUTOBATTERIE GMBH
CYC 6

PI EP 305822 A 19890308 (198910)* DE 6p
R: AT DE ES FR GB SE
DE 3729610 A 19890316 (198912)
EP 305822 B 19911030 (199144)
R: AT DE ES FR GB SE
DE 3865932 G 19911205 (199150)
DE 3729610 C 19920423 (199217) 4p
ES 2026981 T3 19920516 (199228) H01M002-12 <--
EP 305822 B2 19950524 (199525) DE 5p H01M002-12 <--
R: AT DE ES FR GB SE
ADT EP 305822 A EP 1988-113474 19880819; DE 3729610 A DE 1987-3729610 19870904; DE 3729610 C DE 1987-3729610 19870904; ES 2026981 T3 EP 1988-113474 19880819; EP 305822 B2 EP 1988-113474 19880819
FDT ES 2026981 T3 Based on EP 305822
PRAI DE 1987-3729610 19870904
REP US 4463069; US 4613550; EP 132943; GB 1423385; US 4348466
IC ICM **H01M002-12**
ICS **H01M002-04**
AB EP 305822 A UPAB: 19930923
The **battery** has a cover (5) incorporating an integral vent line (4), with a chamber (3) into which a plastics encapsulated porous block (2) is fitted, to provide explosion protection. This block (2) is contained within a capsule (1) incorporating an overpressure valve lying infront of the block (2) in the direction of the **vented gases** and inserted in the **battery** cover (5) perpendicular to the direction of the vent line (4).
Pref. this valve has a valve plate which is spring biased into contact with the apertured base of the capsule (1), the response pressure of the spring pref. lying between 50 mbar and 10mbar.
ADVANTAGE - Protected for use in explosive areas/
1/3
FS EPI
FA AB; GI
MC EPI: X16-F03B

L88 ANSWER 33 OF 59 WPIX (C) 2002 THOMSON DERWENT
AN 1987-170890 [25] WPIX
DNN N1987-128250
TI Lead accumulator **battery** lid - has cover of filling apertures, consisting of self-adhesive foil.
DC X16
IN EISENACHER, W
PA (BOSC) BOSCH GMBH ROBERT
CYC 3
PI DE 3544003 A 19870619 (198725)* 4p
FR 2591803 A 19870619 (198731)
ES 2003981 A 19881201 (198933)
ADT DE 3544003 A DE 1985-3544003 19851213; ES 2003981 A ES 1986-3397 19861212
PRAI DE 1985-3544003 19851213
IC **H01M002-04; H01M010-12**
AB DE 3544003 A UPAB: 19930922
In the lid of a lead accumulator **battery** are formed filling apertures for the required liq., together with a **gas venting** system. The apertures and the **gas venting** system are provided with a suitable cork (23), typically a foil, pref. of a self-adhesive type.
The foil may be of hot-sealing type and may be 0.2 to 3 mm, pref. 0.5 to 1 mm, thick. It may carry a single- or a multi-colour print. It may just cover one **battery** cell block.
ADVANTAGE - Use of foil reduces material requirements both for

single- or **multi-cell** accumulators.
1/2
FS EPI
FA AB
MC EPI: X16-B01B; X16-F01

L88 ANSWER 34 OF 59 JAPIO COPYRIGHT 2002 JPO
AN 1987-163259 JAPIO
TI SEALED LEAD STORAGE **BATTERY**
IN AKABOSHI HIROSHI; YAGYU YOSHIHISA; NAKAJIMA TAKASHI
PA MATSUSHITA ELECTRIC IND CO LTD
PI JP 62163259 A 19870720 Showa
AI JP 1986-5380 (JP61005380 Showa) 19860114
PRAI JP 1986-5380 19860114
SO PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1987
IC ICM H01M002-24
AB PURPOSE: To enhance reliability, by providing common space making notches over jar walls between a **plurality** of **cells**, coupling the cells to each other in the notches, fuse-bonding a jar and an inner cover to each other, and then pouring an electrolytic solution in, to prevent improper sealing.
CONSTITUTION: A **plurality** of **cells** 14 each comprising a positive electrode plate, a negative electrode plate and a separator are housed in a jar 11 and coupled to each other by connector 16 at the electrode rods 17 of the cells so that a hermetically-sealed leaden storage **battery** is constituted. Notches 11b of prescribed depth are provided in the tops of **battery** walls 11a to make a common space over the cells 14. In the space, the cells 14 are coupled to each other. An inner cover 12 and the jar 11 are then fuse-bonded to each other. An adhesive 19 is poured in for sealing. An electrolytic solution is then poured in through a **gas** release **port** and introduced into all the cells 14 through the notches 11b. A safety valve 20 is thereafter attached. For these reasons, the construction of the **battery** is simplified, and the sealing thereof is prevented from becoming improper due to the scattering of the electrolytic solution when it is poured in.
COPYRIGHT: (C)1987,JPO&Japio

L88 ANSWER 35 OF 59 WPIX (C) 2002 THOMSON DERWENT
AN 1986-205558 [32] WPIX
DNN N1986-153324
TI Multiple cell accumulator e.g. starter **battery** - causes **gas** to pass through acid separator and flame trap before being vented to open air.
DC X16 X22
IN BUDER, E; METZ, H U; UBRMEIER, D
PA (VART) VARTA BATTERIE AG
CYC 8
PI DE 3503014 A 19860731 (198632)* 10p
EP 189543 A 19860806 (198632) DE
R: AT DE FR GB SE
JP 61176055 A 19860807 (198638)
US 4678726 A 19870707 (198729)
CA 1265190 A 19900130 (199009)
EP 189543 B 19910821 (199134)
R: AT DE FR GB SE
DE 3583859 G 19910926 (199140)
ADT DE 3503014 A DE 1985-3503014 19850130; EP 189543 A EP 1985-114831 19851122; JP 61176055 A JP 1986-16988 19860130; US 4678726 A US 1986-821497 19860122

PRAI DE 1985-3503014 19850130
REP 2.Jnl.Ref; A3...8647; DE 2906538; EP 123369; EP 53732; FR 429332; FR 860921; GB 1095499; GB 2042249; GB 791139; No-SR.Pub; US 2331450; US 3102220; US 4087592
IC **H01M002-12; H01M010-12**
AB DE 3503014 A UPAB: 19930922
The accumulator (1) comprising a number of cells in a one-piece case has a **gas vent** in the lid (4) to lead **gas** away from the individual cells via a duct (3) to chambers (2) disposed on the side of the case. At least two series-connected chambers are provided the first (8) containing the separator for removing and collecting acid which is carried over from the cells by the **gas**, the second (6) containing the flame trap to prevent the spread of fire if the **gas** ignites externally of the **battery** case.
The separator comprises a perforated wall through which the **gas** has to pass, or a bath of liq. or a combination of both. The flame trap comprises a first filter of sintered porous plastics, sintered metal, a space filled with metal particles, foamed metal or metal wool. A **gas** sensor indicates the state of charge.
1/1
FS EPI
FA AB
MC EPI: X16-F03; X22-F

L88 ANSWER 36 OF 59 WPIX (C) 2002 THOMSON DERWENT
AN 1986-150809 [24] WPIX
DNN N1986-111898
TI **Multicellular battery** esp. starter **battery** with housing and cover - has detachable plug per filler **opening**, duct for **gas** discharge and at least one cell with acid return opening.
DC X16 X22
PA (MOLL-I) MOLL P J
CYC 1
PI DE 3444011 A 19860605 (198624)* 6p
ADT DE 3444011 A DE 1984-3444011 19841203
PRAI DE 1984-3444011 19841203
IC **H01M002-12**
AB DE 3444011 A UPAB: 19930922
The system comprises a **battery** housing (1) having a cover (2) arranged with a filling opening (3) per cell and a detachable dummy plug (4) per filler opening. A duct (7) discharges the acid contg. **gases** leaving the cells. One side of the duct stands in communication with the inner spaces of the individual cells across the dummy plugs, and the other side with the outside.
The cell inner space of at least one cell is arranged with an opening (8) for the return of the acid to the cell.
USE/ADVANTAGE - For starter **battery**. Improved **multicellular battery**, whereby the outside leakage of acid from the **battery** is provided.
1/3
FS EPI
FA AB
MC EPI: X16-F03; X22-F

L88 ANSWER 37 OF 59 WPIX (C) 2002 THOMSON DERWENT
AN 1985-275852 [44] WPIX
DNN N1985-205877 DNC C1985-119836
TI **Gas** depolarisable electrochemical cell stack - in **ventilated** housing with connectors between end cells and

terminals.
DC A85 L03 X16
IN KELM, R W; MCARTHUR, W J
PA (MALO) DURACELL INC
CYC 1
PI US 4547438 A 19851015 (198544)* 10p
ADT US 4547438 A US 1984-683163 19841218
PRAI US 1984-683163 19841218
IC **H01M002-00**
AB US 4547438 A UPAB: 19930925
A **battery** assembly comprises **cells** connected in **series** and in a ventilated housing (12). Terminals (17, 18) extend through an end wall of the housing and are linked by a connector to the first electrode of one end cell and the second electrode of the opposite end cell.

The housing is pref. a rectangular parallelepiped and the housing and terminals are located entirely in a sealed airtight pouch of metallised polyester film. Ventilation is pref. provided by a hydrophobic porous polymer member (38) blocking an aperture (30) in a longitudinal housing wall of impervious polymer, with the member formed as a thin insert retained over the aperture.

ADVANTAGE - Secure and efficient packaging with reliable output and protection against water and damage to extend shelf life.

1/9
FS CPI EPI
FA AB
MC CPI: A05-E01; L03-E01D
EPI: X16-F01; X16-F03

L88 ANSWER 38 OF 59 WPIX (C) 2002 THOMSON DERWENT
AN 1984-036712 [06] WPIX
DNN N1984-027786 DNC C1984-015492
TI Planar cell and **battery** for photographic film cassette - has **gas venting** orifices covered with **gas** permeable sheet.
DC A85 L03 S06 X16
IN LAND, E H
PA (INTP) POLAROID CORP
CYC 1
PI US 4427748 A 19840124 (198406)* 9p
ADT US 4427748 A US 1975-642798 19751222
PRAI US 1973-403039 19731003; US 1975-642798 19751222
IC **H01M002-12**
AB US 4427748 A UPAB: 19930925
A thin flat cell has a planar anode, cathode and separator and electrolyte (27) secured together to make low resistance electrical contact. The anode or cathode includes an **opening**(s) (4,5) for **venting** **gases** formed in the cell, with a continuous layer of **gas** permeable, electrolyte impermeable material, pref. polymeric sheet covering the openings. The separator pref. has its marginal portions (42) impregnated with electrolyte impermeable thermoplastic polymer, esp. vinyl hot melt adhesive.

A flat **battery** comprises at least two flat **cells** connected in **series** by an electrolyte impermeable, electronically conducting inter cell connector, with the openings in an end electrode. A photographic film assembly comprises (a) a photographic film cassette (10) having a transparent front wall portion (19) and a withdrawal opening (20) in a side wall; (b) a stack of planar photographic film units (11) arranged for exposure through the front wall of the cassette and selective withdrawal; (c) a planar **battery** as

above; and (d) a **gas** collector (12) for escaping **gas**.
The vents allows the physical integrity of the **battery** to be maintained and a void **gas** build up causing loss of continuity between cell components.
1/2
FS CPI EPI
FA AB
MC CPI: A12-E06; A12-L02A; L03-B02
EPI: S06-B08; X16-A01A; X16-F03

L88 ANSWER 39 OF 59 WPIX (C) 2002 THOMSON DERWENT
AN 1982-29227E [15] WPIX
TI Maintenance-free sealed lead acid **battery** - for float applications has wholly absorbed electrolyte and relief valve in casing.
DC L03 X16
IN MARSH, F L; RAO, P
PA (GNBB) GNB BATTERIES INC; (GOUN) GOULD INC
CYC 7
PI GB 2084790 A 19820415 (198215)* 14p
FR 2491684 A 19820409 (198219)
JP 57092760 A 19820609 (198229)
DE 3139352 A 19820902 (198236)
GB 2084790 B 19820415 (198437)
CA 1179013 A 19841204 (198502)
KR 8700670 B 19870404 (198745)
IT 1171570 B 19870610 (199005)
DE 3139352 C 19900906 (199036)
ADT GB 2084790 A GB 1981-29672 19811001
PRAI US 1980-193569 19801003
IC **H01M002-12; H01M004-20; H01M010-34**
AB GB 2084790 A UPAB: 19930915
A maintenance free lead acid **battery** suitable for float applications comprises (a) a sealed container divided into cells by internal partitions, and having (b) at least one normally closed relief valve capable of **venting gases** from the container to the atmos. when container press. is 0.5-3.0 psig.
Each cell contains (c) a number of positive and negative plates, comprising self-supporting grids pasted with positive and negative active material respectively; (d) an electrolyte absorbing and retaining separator layer intimately contacting and sepg. the plates; and (e) H2SO4 electrolyte absorbed in plates and separators, which are sufficiently porous to provide a capacity at least 25 A-hr.
The **batteries** are useful for e.g. automobiles, motor cycles, starting outboard motors, standby power for computers; providing high peak power at high rates for brief periods. They have improved volumetric and wt. energy density, can be made in various sizes and may use standard thin wall containers.
FS CPI EPI
FA AB
MC CPI: L03-E03
EPI: X16-B01B; X16-E01

L88 ANSWER 40 OF 59 HCAPLUS COPYRIGHT 2002 ACS
AN 1981:465321 HCAPLUS
DN 95:65321
TI Electric storage **batteries**
IN Pearson, James Ernest
PA Chloride Group Ltd., UK
SO PCT Int. Appl., 18 pp.
CODEN: PIXXD2

DT Patent
LA English
IC H01M010-04; H01M010-34
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 8101077	A1	19810416	WO 1979-GB162	19791008
	W: DE, GB, JP, US				
	RW: FR				
	GB 2072934	A	19811007	GB 1981-16643	19791008
PRAI	WO 1979-GB162		19791008		

AB A sealed Pb-acid **battery** includes a container having a compartment provided with **gas-venting** means and contg. .gtoreq.2 cells. Each cell comprises .gtoreq.1 cathode and .gtoreq.1 anode sepd. from each other by separators of compressible absorbent (microfine glass) fibers. The cells are sepd. by intercell partitions of plastics whose edges are juxtaposed but not sealed to the sides and the bottom of the container. The electrolyte-absorption ratio of the separator is .gtoreq.100% and the electrolyte within each cell is in an amt. such as to be substantially entirely absorbed by the cell components, at least when the cell is fully discharged.
ST sealed lead acid **battery**
IT **Batteries**, secondary
(sealed, lead-acid, glass-fiber separator-contg. **multicell**)

L88 ANSWER 41 OF 59 HCAPLUS COPYRIGHT 2002 ACS
AN 1981:553816 HCAPLUS
DN 95:153816
TI Power source system for train using large capacity sealed nickel-cadmium **battery**
AU Fukui, Kiyoshi; Nakaniwa, Yasuo; Tanaka, Takeo
CS Nippon Denchi K. K., Japan
SO GS News Tech. Rep. (1981), 40(1), 25-30
CODEN: GSNTAA; ISSN: 0385-7204
DT Journal
LA Japanese
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
AB The title power system consists of a large-capacity, rectangular-type sealed Ni-Cd **battery** and a suitable charge-control system. The latter comprises a vented **cell** connected in **series** with the Ni-Cd **battery**. The **gas**-evolution voltage detector of the **vented** cell is used as a signal to stop the recovery charge. Test results and characteristics of the power system are described.
ST nickel cadmium **battery** train traction
IT **Batteries**, secondary
(sealed, nickel-cadmium, charge-control system and, for train power)

L88 ANSWER 42 OF 59 WPIX (C) 2002 THOMSON DERWENT
AN 1979-F8207B [27] WPIX
TI **Multicell** electric storage **battery** lid - has T-section closure strip with venting holes formed in bottom of trough.
DC X16
IN TERRELL, C
PA (CHLO) CHLORIDE GROUP LTD
CYC 1
PI GB 1548129 A 19790704 (197927)*
PRAI GB 1978-6437 19780217
IC **H01M002-12**

AB GB 1548129 A UPAB: 19930901
In the **multicell** electric storage **battery** lid, the portion covering each cell has in it a filling hole with a device for closing it, and a smaller venting hole. The venting holes are formed in the bottom of a trough whose depth exceeds its width. The trough has a closure strip of T-section, the head portion of which closes the top of the trough.
The stem portion and opposed portions of the trough together afford lands where the opposed surfaces fit closely against each other. Adjacent each venting hole there is a recess for **gas** to escape from the **venting** hole to the upper portion of the trough under the head.
FS EPI
FA AB

L88 ANSWER 43 OF 59 HCAPLUS COPYRIGHT 2002 ACS
AN 1979:171525 HCAPLUS
DN 90:171525
TI **Battery** made from multiple electrochemical cells
IN Strasser, Karl
PA Siemens A.-G., Ger.
SO Ger. Offen., 13 pp.
CODEN: GWXXBX
DT Patent
LA German
IC H01M008-24
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	DE 2729640	A1	19790104	DE 1977-2729640	19770630
	DE 2729640	B2	19791108		
	DE 2729640	C3	19800724		
	GB 1588100	A	19810415	GB 1978-22852	19780525
	FR 2396425	A1	19790126	FR 1978-19044	19780626
	FR 2396425	B1	19810807		
	US 4317864	A	19820302	US 1978-918954	19780626
	JP 54013941	A2	19790201	JP 1978-78474	19780628
	JP 61055227	B4	19861126		
	CA 1101488	A1	19810519	CA 1978-306360	19780628
PRAI	DE 1977-2729640		19770630		

AB A **battery** of a **plurality** of fuel **cells** is disclosed, each cell consisting of an electrolyte support, a membrane separator on .gtoreq.1 sides of the support, and a catalyst-contg. electrode on the support-remote separator side. In liq.-impregnated state, the separator is **gas** impermeable. The catalyst is supported on a spacing grid. The metallic contacts located between spacing grids of 2 adjacent cells and on the **battery** ends have **openings** which are connected to the **gas**-reactant supply system.
ST **battery** fuel cell
IT Fuel cells
(**battery** of)

L88 ANSWER 44 OF 59 WPIX (C) 2002 THOMSON DERWENT
AN 1976-G6729X [30] WPIX
TI **Multicell** electrical storage **battery** - has plates connected near upper edges to inter cell or terminal connectors.
DC X16
PA (ELPS) ELECTRIC POWER STORAGE LTD
CYC 1

PI GB 1442995 A 19760721 (197630)*
PRAI GB 1972-59094 19721221
IC **H01M002-02**
AB GB 1442995 A UPAB: 19930901
The **multicell** storage **battery** has a casing, inter cell partitions, and plates connected near the ends of the ends of their upper edges to inter cell or terminus connectors. Means associated with each connector form a **gas** pocket constituting a minor **portion** of the head space of each cell containing the connector in the cell, so as to retain the liquid under the **gas** pocket at a level below that of the connector, irrespective of the level of liquid in the major **portion** of the head space. Each **gas** pocket may be formed by parts of the top of the cell casing or lid and of three adjacent vertical walls of the cell, together with a lintel projecting down from the top of the cell.
FS EPI
FA AB

L88 ANSWER 45 OF 59 HCAPLUS COPYRIGHT 2002 ACS
AN 1976:526983 HCAPLUS
DN 85:126983
TI Maintenance-free lead-acid **battery**
IN Mao, George W.; Trenter, James P.; Rao, Purushothama
PA Gould, Inc., USA
SO Ger. Offen., 21 pp.
CODEN: GWXXBX
DT Patent
LA German
IC H01M010-12
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
FAN.CNT 5

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	DE 2511339	A1	19760422	DE 1975-2511339	19750314
	DE 2511339	C2	19841213		
	JP 51048132	A2	19760424	JP 1975-31229	19750317
	GB 1489141	A	19771019	GB 1975-10981	19750317
	AU 7579242	A1	19760923	AU 1975-79242	19750318
	CA 1041166	A1	19781024	CA 1975-236233	19750924
	BE 834263	A1	19760407	BE 1975-160743	19751007
	FR 2287782	A1	19760507	FR 1975-30674	19751007
	FR 2287782	B1	19800620		
	SE 7511279	A	19760412	SE 1975-11279	19751008
	SE 421466	B	19811221		
	SE 421466	C	19820401		
	NL 7511958	A	19760413	NL 1975-11958	19751010
	ES 441713	A1	19770616	ES 1975-441713	19751010
	US 4166155	A	19790828	US 1978-921653	19780703
PRAI	US 1974-514019		19741011		
	US 1974-514020		19741011		
	US 1974-514023		19741011		
	US 1976-742611		19761117		

AB Maintenance-free Pb-acid **batteries** comprise a casing with a **plurality** of **cells** contg. cathodes and anodes, a cover, a **gas vent**, and an electrolyte. The Pb alloys for the cathode grids contain 1.0-2.0 Sb and 1.2-2.2 Cd; those for the anode grids contain 0.06-0.2 Ca and 0.1-0.4% Sn. The Cd content of the cathode grid alloys is not smaller than their Sb content.
ST lead **battery** maintenance free
IT **Batteries,** secondary

(lead-acid, maintenance-free)
IT 60475-61-8
RL: USES (Uses)
(anode grids of, lead-acid **battery**)
IT 60475-60-7
RL: USES (Uses)
(cathode grids of, lead-acid **battery**)

L88 ANSWER 46 OF 59 COMPENDEX COPYRIGHT 2002 EEI
AN 1976(11):1375 COMPENDEX DN 761173402
TI TRUTH ABOUT Ni-Cd CELL REVERSAL.
AU Pensabene, Saverio F. (GE, Gainesville, Fla)
SO Mach Des v 48 n 14 Jun 10 1976 p 97-99
CODEN: MADEAP
PY 1976
LA English
AB Rechargeable nickel-cadmium **cells** connected in **series** ideally should have nearly equal energy capacity. Otherwise, under deep discharge on a **multicell battery** the first cell to completely discharge could generate **gas** and, unless equipped with a safety **vent**, could burst. This phenomenon, called cell reversal, gave earlier completely sealed nickel-cadmium cells a bad reputation. Now, cells produce oxygen during overcharge which penetrates the insulating material to reach the cadmium and convert it back to its uncharged cadmium hydroxide form. Some manufacturers have added a material to both plates that accepts electrons more easily than hydroxyl or water molecules.
CC 702 Electric Batteries & Fuel Cells
CT *ELECTRIC **BATTERIES**, SECONDARY:**Gas** Emission
ET Cd*Ni; Cd sy 2; sy 2; Ni sy 2; Ni-Cd

L88 ANSWER 47 OF 59 WPIX (C) 2002 THOMSON DERWENT
AN 1975-D2914W [12] WPIX
TI **Battery venting** passageway outside of or in **gas**-pervious layers - uses inner and outer **gas**-pervious layer of different permeability.
DC X16
PA (ESBI) ESB INC
CYC 1
PI US 3870566 A 19750311 (197512)*
PRAI US 1973-421159 19731203
IC **H01M001-06**
AB US 3870566 A UPAB: 19930831
The passageway is intended for the **venting** of **gases** generated by the cell. The passageway is outside of or in a **gas** -pervious layer of the cell enclosure, and **gases** travel between the interior of the cell and the passageway by first passing through the **gas**-pervious layer. The passageway may be the centre of a hollow, **gas**-pervious fibre. Alternatively, a fibre may be in a passageway between the unlaminated surfaces of an inner **gas**-pervious layer and an outer layer which is impervious to liquids and less pervious than the inner layer to the **gases** generated by the cell. The **gas**-pervious layer may be on the outside face of an end cell of the **battery** to provide a terminal **vent**, or situated within a **gas**-pervious adhesive, or situated between the cells of a **multicell battery**.
FS EPI
FA AB

L88 ANSWER 48 OF 59 WPIX (C) 2002 THOMSON DERWENT

AN 1975-G1938W [24] WPIX
TI **Multi-cell battery** - has valves in cell dividing walls and end **outlet** valve to release **gas**.
DC X16
PA (MOLL-I) MOLL P J
CYC 2
PI DE 2358517 A 19750605 (197524)*
DE 2358517 B 19771215 (197751)
AT 7409229 A 19780115 (197806)
PRAI DE 1973-2358517 19731123
IC **H01M002-12**
AB DE 2358517 B UPAB: 19930831
The **multi-cell battery** has the dividing walls between cells leading up to filler caps in the top of the **battery**. The filler caps can be removed separately by unscrewing. Each dividing wall has a hole sealed either by a membrane or by a valve. The end of the **battery** housing has a plug or another valve inserted through it. As the **gas** pressure in the separate cells increases so the appropriate valves **open** and finally allow the **gas** to escape to the atmosphere through the end outlet valve. The valves are sited above the level of the **battery** electrolyte.
FS EPI
FA AB

L88 ANSWER 49 OF 59 WPIX (C) 2002 THOMSON DERWENT
AN 1975-D0570W [12] WPIX
TI **Battery** coverplate with controlled **gas** **ventilation** - uses barrel shaped elastic stoppers between coverplate and filling hole.
DC X16
PA (SOMN) ACCUMULATORENFAB SONNENS
CYC 1
PI DE 1905215 B 19750313 (197512)*
PRAI DE 1969-1905215 19690203
IC **H01M002-36**
AB DE 1905215 B UPAB: 19930831
The coverplate for **multicell batteries** has filling hole stoppers with ventilation passages and flanges. The flanges extend in longitudinal direction of the cover/carrier-plate. The outer shell of the stopper one for each filling hole - when inserted is distorted by the inner wall of the filling hole and at the same time the flange on the stopper is pressed against the underside of the coverplate. The coverplate has inside the rim of the stopper at least one ventilation hole. For circular filling holes the stopper is barrel-shaped. The mobility of each stopper is restricted by stops in the guidance slots in the coverplate. The arrangement achieves inspite of the in practice required movement of the stoppers a **gas**-tight connection of the stopper with the coverplate and with the filling hole and secures a controlled **gas** flow through the **ventilation** holes.
FS EPI
FA AB

L88 ANSWER 50 OF 59 HCAPLUS COPYRIGHT 2002 ACS
AN 1975:482619 HCAPLUS
DN 83:82619
TI Filter-press type fuel cell **battery** with improved diaphragm members
IN Kohlmueller, Hans
PA Siemens A.-G., Fed. Rep. Ger.
SO Can., 15 pp.

CODEN: CAXXA4
DT Patent
LA English
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
FAN.CNT 2

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	CA 965477	A1	19750401	CA 1971-114196	19710528
	DE 2026220	A	19711209	DE 1970-2026220	19700529
	CH 526206	A	19720731	CH 1971-526206	19710416
	FR 2093835	A5	19720128	FR 1971-19346	19710527
	FR 2090386	A5	19720114	FR 1971-19652	19710528
	FR 2090386	B1	19760430		
	JP 56039034	B4	19810910	JP 1971-36371	19710528
PRAI	DE 1970-2026220		19700528		

AB The cell **battery** for reacting a liq. electrolyte and .gtoreq.1 **gaseous** reactant consists of a **plurality** of fuel **cells** each contg. 2 electrodes. The cells are sepd. by metal sheets. Each cell has .gtoreq.1 asbestos diaphragm member and forms .gtoreq.1 **gas** space and an electrolyte space sepd. from each other by the diaphragm. The diaphragm has a rim **portion** **gastight** and impervious to the electrolyte. Thickness of the rim is greater than the remaining portion of the diaphragm. The diaphragm members and metal sheets are sequentially stacked and held at the lateral surfaces of the rim portions which have resp. passages communicating with the **gas** space and the electrolyte space of the corresponding fuel cell.
ST fuel cell **battery**; filter press fuel cell
IT Asbestos
RL: USES (Uses)
(diaphragm, for filter-press type fuel cell **battery**)
IT Fuel cells
(filter-press type **battery** of, with asbestos diaphragm)

L88 ANSWER 51 OF 59 WPIX (C) 2002 THOMSON DERWENT
AN 1974-L6065V [50] WPIX
TI **Gas venting** manifold for **multicell** **batteries** - made from plastic moulding with bellows sections between inlets.
DC X16
PA (MOLL-I) P J MOLL
CYC 2
PI DE 2419847 A 19741205 (197450)*
AT 7304097 A 19750515 (197523)
PRAI AT 1973-4097 19730509
IC **H01M001-00; H01M002-12**
FS EPI
FA NOAB

L88 ANSWER 52 OF 59 HCAPLUS COPYRIGHT 2002 ACS
AN 1971:27528 HCAPLUS
DN 74:27528
TI Low-current, low-capacity metal/air **battery**
IN Katsoulis, Emanuel G.
PA Leesona Corp.
SO U.S., 5 pp.
CODEN: USXXAM
DT Patent
LA English
IC H01M

NCL 136086000
CC 77 (Electrochemistry)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 3533845	A	19701013	US 1967-612269	19670127

AB A lightwt. metal/air or metal/O **battery** is described which is composed of a **plurality** of single **cells** in a common frame. The single cells comprise a consumable metal anode (such as Pb, Zn, Fe, Cd, Al, Mg), a lightwt. nonconsumable cathode, and an electrolyte (KOH, NaOH, H3PO4, etc.) sepg. the anode and cathode. The cathode comprises a **gas**-permeable, liq. impermeable **hydrophobic** membrane and an electrocatalyst at 1 surface. The cathode is positioned in the cell so that the electrocatalyst is in contact with the electrolyte and the hydrophobic membrane is in contact with an air or O supply. Two frames of the single cells are enclosed in a suitable housing with the cathodes facing each other and sepd. by an intercell spacer. The **battery** is capable of low current, low capacity application at temps. at least as low as -40.degree..

ST metals air **batteries**; air metals **batteries**; **batteries** metals air; oxygen metals **batteries**

IT **Batteries**, primary
(metal-air, with consumable anode)

IT 7440-66-6, uses and miscellaneous
RL: USES (Uses)
(anodes, in metal-air primary **batteries**)

L88 ANSWER 53 OF 59 HCAPLUS COPYRIGHT 2002 ACS
AN 1969:487180 HCAPLUS
DN 71:87180
TI **Gas** depolarized electrical power unit
IN Kent, Clifford E.
PA General Electric Co.
SO U.S., 7 pp.
CODEN: USXXAM
DT Patent
LA English
IC H01M
NCL 136086000
CC 77 (Electrochemistry)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 3457115	A	19690722	US 1965-511392	19651203
	BE 690590	A	19670516	BE 1966-690590	19661202
	NL 6617049	A	19670605	NL 1966-17049	19661202
PRAI	US 1965-511392		19651203		

AB A **gas**-depolarized elec. power unit is described which employs a ppt. producing solid metal anode positioned removably within a removable filter within a casing for confining an eletrolyte. Such cells are also described which include at least one **gas**-depolarizing electrode as a **portion** of the casing. Further, such cells are provided with both the above anode structure and the above casing structure. Elec. power units are described which include a **plurality** of the above **cells** connected elec. For example, a Mg-air cell was provided with a nylon filter material having a mean pore diam. of 1/50 inch and a free area of 55%. The cell was operated at a c.d. of 1.2 ma./cm.2 and a potential of .apprx.1.3 v. When the Mg plate had been substantially consumed, the filter with the ppt. was removed from the casing. It was noted that substantially all of the ppt. was contained by the filter

material. The filter was easily removed, and during operation negligible **gas** entrapment in the filter material was noted.
ST **gas** depolarized elec power cell; depolarized **gas** elec power cell; elec power cell **gas** depolarized; cell elec power **gas** depolarized
IT **Batteries**, primary
(metal-air, with replaceable anode)
IT 7439-95-4, uses and miscellaneous 7440-66-6, uses and miscellaneous
RL: USES (Uses)
(anodes, replaceable, in fiber bag to retain reaction products)

L88 ANSWER 54 OF 59 HCAPLUS COPYRIGHT 2002 ACS
AN 1969:435491 HCAPLUS
DN 71:35491
TI Fuel cells
IN Matsuno, Shiro
PA Yuasa Battery Co., Ltd.
SO U.S., 5 pp.
CODEN: USXXAM
DT Patent
LA English
IC H01M
NCL 136086000
CC 77 (Electrochemistry)
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 3442714	A	19690506	US 1968-708726	19680227

AB The H-O fuel cell comprises a hollow tube contg. a no. of individual **cells** connected in **series**. Each cell consists of 2 electrodes and each electrode is a mass of unbonded discrete granules. The electrodes are sepd. from each other by a gas-impervious separator and the electrodes of adjacent cells are sepd. by a **gas**-impervious **membrane** across the tubular frame which is elec. conductive. Ducts in the frame supply oxidizing and fuel gases to the resp. electrodes. The neg. electrode is active carbon 100 parts, acetylene black 10 parts, and PdCl2 (2% soln.) 100 parts. These materials are mixed and heated to 450.degree. in a H2 atm. and the granular product mixed with 30% KOH soln. in 1:1 ratio by wt. The pos. electrode contains active carbon 100 parts, acetylene black 10 parts, graphite 5 parts, and MnCl2 (5% soln.) 100 parts. These materials are mixed, neutralized with NaOH, washed with H2O, dried, and made semiwettable with 30% KOH soln. 1:1 by wt. of material to soln. A pos. electrode, a separator, a neg. electrode, and the collector make up a cell. In a 10-**cell series** -connected **battery** with an electrode reacting area of 100 cm.2, the discharge voltage was 7.5 v., and the polarization was 2.5 v. at a c.d. of 30 ma./cm2.
ST fuel cells; hydrogen fuel cells; oxygen fuel cells
IT Fuel cells
(hydrogen-oxygen)

L88 ANSWER 55 OF 59 HCAPLUS COPYRIGHT 2002 ACS
AN 1967:487121 HCAPLUS
DN 67:87121
TI A new fuel-cell concept
AU Warszawski, Bernard
SO Entropie (1967), No. 14, 33-45
CODEN: ENTPA5
DT Journal
LA French

CC 77 (Electrochemistry)
AB The usual form of assocg. 2 chem. regenerators to the electrochem. cell proper is retained. The elementary cell is divided into 2 half-cells sepd. by a semipermeable membrane and there are 2 nonporous, grid-like electrodes, each 0.55-mm. thick and made of plastic charged with carbon or graphite powder. An electrolytic soln. goes through each half-cell lengthwise along the electrode; both solns. flow in parallel, each carrying its own reagent. The whole area of the electrode is thus a reaction zone; the movement of the reagents is by forced convection only; thus, if the buffer has a proper concn. with respect to the reagent concn., no pH polarization can occur; the narrow electrolytic compartment allows poorly conductive electrolytes to be used. It is preferable to operate with a const. inlet reagent concn. (then the outlet concn. is const. and can be made very small) and to adjust the flow of electrolyte to the load. The absence of natural convection insures that there is no rehomogenization of the soln. in its compartment. By making the outlet concn. of the anodic compartment very small and by mixing the outlet anodic and cathodic electrolytes, a single electrolyte is obtained which can be recirculated to the inlets of the cell. This mixing cycle assures the rehomogeneization of the electrolytes. When the elementary **cells** are in **series**, the electrolytic continuity in the microchannels is ruptured by **gaseous** bubbles brought about by the start of the electrolysis of the shunting liquid, and this prevents the shunt currents from growing as fast as theory would indicate. It is possible to use a **gaseous** reagent, because a **gas** -electrolyte mixt. flows through the cell without trouble and with min. pumping power. In addn. to the usual catalysts, those that are destroyed in strong alk. media (e.g., redox catalysts of the oxide systems or metallic salts) can be used. The catalysts are free of any poisoning mechanism that would affect phys.-type catalysts. When the catalyst is formed via a chem. or electrochem. technique, the damaged catalyst can be reformed without taking the cell apart by passing a suitable soln. through the cell. Reaction products are eliminated by decantation of the **outlet** mixt. if they are **gaseous** and by an overflow system if they are sol. in the electrolyte. Since the pH of the electrolyte in the anodic compartment can be made very low, the decarbonation of basic electrolytes is "natural"; any carbonic acid present in the electrolyte will go out as a **gas** when the pH of the anodic soln. reaches 9-10. A typical **battery** contains 180 elements assembled in a press-filter structure, has a vol. of 2 dm.3, and gives 1.6-2 kw. at usual temps. with reducing agents such as hydrazine and oxidants such as H2O2.
ST FUEL CELL
IT Fuel cells

L88 ANSWER 56 OF 59 HCAPLUS COPYRIGHT 2002 ACS
AN 1967:25470 HCAPLUS
DN 66:25470
TI Electrolytic **battery**
PA Societe des Accumulateurs Fixes et de Traction
SO Neth. Appl., 13 pp.
CODEN: NAXXAN
DT Patent
LA Dutch
IC H01M
CC 77 (Electrochemistry)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	NL 6601518		19660810		

PRAI FR 19650209
AB The electrolyte is brought into contact with the electrodes only at the moment of use. A no. of elementary **cells** connected in **series** are packed into groups, which in turn are connected in parallel and (or) in series. The successive groups of cells can be fed with electrolyte from a reservoir. Conducting carriers, which are placed between the groups of **cells** and connected in **series**, form distribution chambers both for the feeding of the electrolyte and for the **venting** of **gases** formed. Each cell consists of an anode of porous Ag2O2, a separator, a cathode of porous Zn on a suitable supporting metal, and KOH as the electrolyte. The **battery** is assembled in a cylindrical form, one end of it being formed by the electrolyte reservoirs coupled with the device for operating the **battery**, the carriers, the electrodes, etc., while the other end of it is formed by one or more reservoirs for collecting the electrolyte flowing across the electrodes.
ST ELECTROLYTIC **BATTERY**; **BATTERY** ELECTROLYTIC
IT **Batteries**, secondary
(silver-zinc)

L88 ANSWER 57 OF 59 HCAPLUS COPYRIGHT 2002 ACS
AN 1966:9385 HCAPLUS
DN 64:9385
OREF 64:1658g-h
TI Galvanic **battery**
PA Pentti Juuse Tamminen
SO 3 pp.
DT Patent
LA Unavailable
NCL 136132000
CC 15 (Electrochemistry)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 3210217		19651005	US	19620424

AB A number of **batteries** (Zn-C, HgO, Ni-Cd), both singly and in **multicell** arrangements were rendered leakproof by winding them with thin films of poly(vinyl chloride), Teflon, nylon, polyethylene, or rubber under tension. For **gas venting**, longitudinal grooves were worked into the films, or paper, talc, or paint could be applied between the film layers. This permitted the escape of **gas** in a spiral fashion.
IT Cells, voltaic
(leakproof, wound with plastic tape)

L88 ANSWER 58 OF 59 WPIX (C) 2002 THOMSON DERWENT
AN 1973-04814U [04] WPIX
TI Fuel cell **battery** - using hydrazine fuel and having controlled oxidant flow.
DC L03 U24 X16
PA (SIEI) SIEMENS AG
CYC 2
PI US 3711333 A (197304)*
GB 1358764 A 19740703 (197427)
PRAI DE 1970-2044068 19700905
IC G05F001-10; **H01M027-00**
AB US 3711333 A UPAB: 19930831
A fuel cell **battery** using hydrazine fuel dissolved in liq. electrolyte and **gaseous** O2-contg. oxidant, has the fuel cells divided into blocks with the cells in each block electrically connected in

series. Fuel traverses each fuel cell in parallel and oxidant traverses each cell within a block in parallel but traverses the blocks in **series**. The number of **cells** in each block decreases in the direction of oxidant flow, so flow rate is higher in the last blocks. This compensates for the increasing concn. of reaction prods. in the oxidant stream. Oxidant flow is controlled by a valve in the **gas outlet**, the valve being controlled by comparing voltages of different blocks. Oxidant flow is related to need under changing conditions, providing a Faraday yield w.r.t. oxygen of about 80-90%.

FS CPI EPI
FA AB
MC CPI: L03-E04

L88 ANSWER 59 OF 59 WPIX (C) 2002 THOMSON DERWENT
AN 1970-11072R [08] WPIX
TI Deferred action **battery** using mangesium and silver - chloride electrodes.
DC L03 X16
PA (NIST) JAPAN STORAGE BATTERY CO LTD
CYC 1
PI US 3496025 A (197008)*
PRAI JP 1966-47810 19660721; JP 1966-47812 19660721
IC **H01M013-10; H01M017-06**
AB US 3496025 A UPAB: 19930831
The electrodes are mounted on a frame made of an electrically insulating material. The positive electrode is mounted within the frame window. A layer of conductive foil is bonded to the negative electrode and these are mounted over the window with the conductive foil adjacent the positive electrode. A lower cavity provides an opening for the electrolyte and an upper cavity provides an **outlet** for **gases** generated during operating of the **battery**.

Rims on the frame have a depth greater than that of the electrodes, and are adapted to be bonded to an adjacent frame to form a **multicell** arrangement.

Specifically the positive electrode is a silver chloride plate, the negative electrode is a magnesium plate and the conductive foil is silver. Any suitable electrolyte, such as water or salt water may be used.

The **battery** is relatively small and is resistant to atmospheric moisture. Leakage is minimal, and the **battery** has excellent resistant to mechanical shock and vibration.

FS CPI EPI
FA AB